

AD-752 700

PYROTECHNICS

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November 1972

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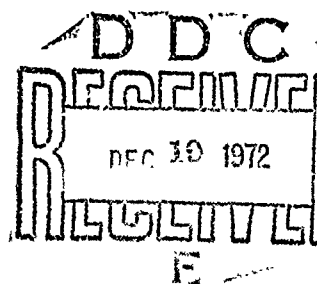
A DDC BIBLIOGRAPHY

DDC-TAS-72-66

NOVEMBER 1972

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Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) DEFENSE DOCUMENTATION CENTER Cameron Station Alexandria, Virginia		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	
		2b. GROUP	
3. REPORT TITLE PYROTECHNICS			
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Bibliography (November 1956 - February 1972)			
5. AUTHOR(S) (First name, middle initial, last name)			
6. REPORT DATE November 1972		7a. TOTAL NO. OF PAGES 250	7b. NO. OF REFS 180
8a. CONTRACT OR GRANT NO.		8b. ORIGINATOR'S REPORT NUMBER(S) DDC-TAS-72-66	
8c. PROJECT NO.		8d. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) AD-752 700	
10. DISTRIBUTION STATEMENT Approved for public release; distribution unlimited			
11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY	
13. ABSTRACT This bibliography is a collection of unclassified references to unclassified reports on pyrotechnics. These references pertain to composition, safety; design, configuration, launching, binders, release mechanisms, performance and capability of pyrotechnics. Flares, munitions, grenades, cartridges, bombs, and projectiles containing chemicals that produce brilliant light for illumination or colored lights or smoke for transmitting information for military purposes are discussed. Corporate Author-Monitoring Agency, Subject, Title, and Personal Author Indexes are included.			

DD FORM 1473
1 NOV 65

UNCLASSIFIED

Security Classification

UNCLASSIFIED

Security Classification

14.	KEY WORDS	LINK A		LINK B		LINK C	
		ROLE	WT	ROLE	WT	ROLE	WT
	<ul style="list-style-type: none">*Pyrotechnics*BibliographiesAircraft FlaresRocket FlaresSpotting ChargesSmoke MunitionsSmoke ProjectilesIlluminating ProjectilesPhotoflash CartridgesWhite PhosphorusColored FlaresParachute FlaresPhotoflash BombsGrenadesIlluminating GrenadesSmoke BombsSignalsRocketsMarkersBindersRelease MechanismsFlare Dispensers						
	-ib-						

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- 11 -

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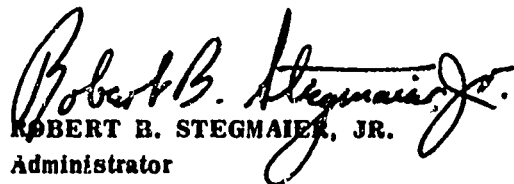
F O R E W O R D

This bibliography is a collection of 180 unclassified references to reports on *Pyrotechnics*. Entries were selected from references processed into the Defense Documentation Center AD data bank from January 1953 through March 1972.

Corporate Author-Monitoring Agency, Subject, Title, and Personal Author Indexes are included.

BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY

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ROBERT B. STEGMAIER, JR.
Administrator

Defense Documentation Center

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PERSONAL AUTHOR.....	P-1

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-248 978

NAVAL AMMUNITION DEPOT CRANE INC

THERMOCHEMICAL ANALYSES OF A PYROTECHNIC SMOKE MIXTURE

(U)

SEP 60 1V FOWLER, F.D.; PURDIE, J.E.; WALKER, W.L.;
REPT. NO. GE C 60 319

UNCLASSIFIED REPORT

DESCRIPTORS: *COLORED SMOKES, *IGNITION, *PYROTECHNICS,
*QUINONES, *SMOKES, *THERMOCHEMISTRY, ACCIDENTS,
ANTHRACENES, EXPLOSIONS, HUMIDITY, INSECTICIDES, METHYL
RADICALS, NITROCELLULOSE, POTASSIUM COMPOUNDS (U)

FROM THERMAL INVESTIGATION OF THE SMOKE MIXTURE, IT WAS CONCLUDED THAT THE CHANGING OF THIOUREA TO AMMONIUM THIOCYANATE AT 160C WAS THE IGNITION DETERMINING FACTOR. WHEN THIS TRANSITION OCCURRED, IT CATALYZED THE DECOMPOSITION OF THE POTASSIUM CHLORIDE, CAUSING THE IGNITION OF THE MIXTURE. THE PRESENCE OF THE RED DYE WILL ALSO CATALYZE THE DECOMPOSITION OF THE POTASSIUM CHLORATE, BUT (OVER) NOT NEARLY TO THE EXTENT AS AMMONIUM THIOCYANATE. EXPOSURE OF THE SMOKE MIXTURE AND ITS INGREDIENTS TO AN ENVIRONMENT OF 95% RH AND 85F FOR 8 DAYS HAD NO PRONOUNCED EFFECT. THE ENERGY OF ACTIVATION OF THE SMOKE MIXTURE, HOWEVER, INCREASED UPON EXPOSURE. THIS IS DUE IN PART TO THE FACT THAT THE SAMPLES WERE AIR DRIED FOR TWO HOURS BEFORE ANALYSIS; THEREFORE, SOME ABSORBED WATER WAS STILL PRESENT. THIS INCREASE IN THE ENERGY OF ACTIVATION PROVES THAT THE MIXTURE IS MORE DIFFICULT TO IGNITE UPON EXPOSURE TO HUMID ENVIRONMENTS. THE SMOKE MIXTURE WAS IN NO WAY RESPONSIBLE FOR THE ACCIDENTAL EXPLOSION OF THE WAVE-OFF SIGNAL DURING THE JAN CYCLE. THE ADDITION OF SODIUM BICARBONATE ACTS AS A COOLANT TO THE MIXTURE AND INCREASES ITS ENERGY OF ACTIVATION. THE INCREASE OF THE ACTIVATION ENERGY OF THE MIXTURE NOT CONTAINING THE BICARBONATE, WHEN EXPOSED TO HUMIDITY, WAS APPROXIMATELY EQUAL TO THAT OF THE MIXTURE CONTAINING THE BICARBONATE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-255 726

NAVAL AMMUNITION DEPOT CRANE IND

CHEMICAL ANALYSIS OF A MAGNESIUM-SODIUM NITRATE
COMPOSITION IN A LAMINAC BINDER

(U)

APR 61 1V RIPLEY, WILLIAM;
REPT. NO. RDTR 21

UNCLASSIFIED REPORT

DESCRIPTORS: •BINDERS, •CHEMICAL ANALYSIS, •ILLUMINATING
PROJECTILES, •PYROTECHNICS, •QUANTITATIVE ANALYSIS,
•VOLUMETRIC ANALYSIS, COBALT, COLORIMETRIC ANALYSIS,
ESTERS, FLARES, MAGNESIUM, NITRATES, PLASTICS, POLYMERS,
POWDERS, PROPELLANT FLASHES, PROPELLANTS, SEPARATION,
SODIUM COMPOUNDS

(U)

A SCHEME FOR THE CHEMICAL ANALYSIS OF AN ILLUMINANT
COMPOSITION OF MG, NaNO_3 , AND LAMINAC 4110
BINDER IS DESCRIBED. NaNO_3 IS REMOVED BY WATER
EXTRACTION AND TREATED, UNDER AN INERT ATMOSPHERE,
WITH FeCl_2 AND 12 N HCL. THE FERRIC ION
FORMED IN THIS REACTION IS THEN TITRATED WITH
STANDARD 0.2 N TiCl_3 SOLUTION. MG IS REMOVED
WITH DILUTE HCL AND DETERMINED BY TITRATION WITH
0.1 M EDTA SOLUTION. LAMINAC BINDER IS DETERMINED
FROM THE SUM OF THE VOLATILES AND THE RESIDUE
REMAINING AFTER THE EXTRACTION OF NaNO_3 AND
SUBSEQUENT REMOVAL OF MG. THE PRESENCE OF CO
DUE TO COBALT NAPHTHANATE IS DETECTED BY THE ORANGE
COLOR DEVELOPED IN THE PRESENCE OF 1-NITROS02-
NAPHTHOL. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-255 812

ABERDEEN PROVING GROUND MD

BALLISTIC COMPARISON OF SHELL, 76-MM, WP-T, T140E4,
WITHOUT TRACER, AND SHELL, 76-MM, HE, M352 (U)

MAY 61 1V ANGSTADT, R.P.;
REPT. NO. DPS 199

UNCLASSIFIED REPORT

DESCRIPTORS: *PROPELLING CHARGES, *SMOKE PROJECTILES,
AMMUNITION, BALLISTICS, EXTERIOR BALLISTICS, HIGH
EXPLOSIVE AMMUNITION, PHOSPHORUS, PROJECTILES, RANGE
TABLES, RANGES (DISTANCE), SAFETY, STABILITY, TESTS (U)
IDENTIFIERS: M-352 CARTRIDGES, 76-MM, T-140
CARTRIDGES, 76-MM (U)

THE PURPOSE OF THIS TEST WAS TO ESTABLISH A CHARGE
FOR THE SHELL, 76-MM, WP-T, T140E4
(14.72LB), WITHOUT TRACER, AND TO DETERMINE IF A
BALLISTIC MATCH EXISTS BETWEEN THIS ROUND AND 15.0-
LB, HE, M352 SHELL. TEST PHASES INCLUDED CHARGE
ESTABLISHMENT, RANGE AND SAFETY, AND ACCURACY AND
TIME OF FLIGHT. RANGE TABLES PREPARED FOR THE HE,
M352 ROUND MAY BE USED FOR THE SHELL WP-T,
T140E4, (WITHOUT TRACER). IT SHOULD BE NOTED,
HOWEVER, THAT SINCE THE WP ROUND NOW WEIGHS 0.28 LB
LESS THAN THE HE ROUND, THE WP ROUND (WITHOUT
TRACER) MAY YIELD SOMEWHAT SHORTER RANGES THAN THE
TABLE WOULD INDICATE. IF EITHER ROUND IS MODIFIED,
ADDITIONAL TESTING SHOULD BE CONDUCTED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-257 189

PICATINNY ARSENAL DOVER N J

ENCYCLOPEDIA OF EXPLOSIVES AND RELATED ITEMS. VOLUME
1 (U)

60 1V FEDOROFF, BASIL T.; AARONSON, HENRY A.;
REPT. NO. TR-2700

UNCLASSIFIED REPORT

DESCRIPTORS: *DICTIONARIES, *EXPLOSIVE MATERIALS,
*PROPELLANTS, *PYROTECHNICS, AMMUNITION, INDUSTRIAL
PRODUCTION, MATERIALS, MILITARY CHEMICALS, MUNITIONS,
MUNITIONS INDUSTRY, ORDNANCE, PHOSPHORUS COMPOUNDS,
PROJECTILES, SCIENTIFIC PERSONNEL, WEAPONS (U)

THE FIRST VOLUME (A TO AZOXY) OF AN
ENCYCLOPEDIA OF EXPLOSIVES AND RELATED ITEMS IS
PRESENTED. THE ENCYCLOPEDIA IS INTENDED TO COVER:
(1) MILITARY, INDUSTRIAL, AND OTHER EXPLOSIVES;
EXPLOSIVE COMPOSITIONS; PROPELLANTS; AOF THE PRESENCE
OF PHOSPHORIC GROUPS; (4) AMMUNITION ITEMS, SUCH
AS PROJECTILES, BOMBS, GRENADES, DETONATORS, FUZES;
(5) CALIBERS OF WEAPONS AND PROJECTILES USED IN
THE US AND FOREIGN COUNTRIES; (6) BRIEF
DEFINITIONS OF ORDNANCE TERMS; AND (7) NAMES OF
SCIENTISTS WHO HAVE MADE IMPORTANT PYROTECHNIC
COMPOSITIONS; (2) ANALYTICAL PROCEDURES FOR THE
MORE COMMON EXPLOSIVES, PROPELLANTS, AND PYROTECHNIC
COMPOSITIONS; (3) COMPOUNDS WHICH DEFLAGRATE OR
MAY POSSIBLY EXPLODE BECAUSE OF THE PRESENCE OF
PHOSPHORIC GROUPS; (4) AMMUNITION ITEMS, SUCH AS
PROJECTILES, BOMBS, GRENADES, DETONATORS, FUZES;
(5) CALIBERS OF WEAPONS AND PROJECTILES USED IN
THE US AND FOREIGN COUNTRIES; (6) BRIEF
DEFINITIONS OF ORDNANCE TERMS; AND (7) NAMES OF
SCIENTISTS WHO HAVE MADE IMPORTANT CONTRIBUTIONS IN
THE FIELDS OF EXPLOSIVES, AMMUNITION, AND WEAPONS.
THIS VOLUME CONTAINS SECTIONS ON PHYSICAL TESTS
USED TO DETERMINE EXPLOSIVE PROPERTIES;
ABBREVIATIONS, CODE NAMES, AND SYMBOLS; DESCRIPTIVE
TEXT OF ENCYCLOPEDIA ITEMS; TABLES CONCERNING US,
BRITISH, AND GERMAN SIEVE SERIES; AND CALIBERS
OF US AND FOREIGN AMMUNITION; AND AN INDEX OF
SUBJECTS AS ALTERNATE NAMES OF ITEMS. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-257 359

NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AERONAUTICAL
PHOTOGRAPHIC EXPERIMENTAL LAB

INVESTIGATION OF CURRENT TECHNIQUES OF LOW ALTITUDE
PYROTECHNIC FLASH NIGHT AERIAL RECONNAISSANCE
PHOTOGRAPHY

(U)

JUL 60 IV TAFEL, ROBERT W. I

UNCLASSIFIED REPORT

DESCRIPTORS: •AERIAL RECONNAISSANCE, •NIGHT PHOTOGRAPHY,
•PYROTECHNIC PROJECTORS, AERIAL CAMERAS, AERIAL
PHOTOGRAPHS, AERIAL PHOTOGRAPHY, FLIGHT TESTING,
ILLUMINATING PROJECTILES, ILLUMINATION, MATHEMATICAL
ANALYSIS, PROJECTILE TRAJECTORIES

(U)

THIS ANALYSIS TRACES THE DEVELOPMENT OF THE
PYROTECHNIC FLASH NIGHT PHOTOGRAPHIC SYSTEM WITH
SPECIAL EMPHASIS ON ITS APPLICATION AND USE IN
NAVAL RECONNAISSANCE AIRCRAFT. A PROGRAM OF
MATHEMATICAL ANALYSIS IS DESCRIBED WHICH INCLUDES THE
DEVELOPMENT OF A GRAPHICAL METHOD OF PRESENTING THE
OPERATIONAL LIMITS OF THE NIGHT PHOTOGRAPHIC SYSTEM.
A CORRELATION IS MADE BETWEEN FLIGHT TEST DATA AND
MATHEMATICAL DATA WHICH REVEALS THAT THE WIDELY
ACCEPTED VALUE OF .09 FOOT-CANDLE-SECONDS FOR MINIMUM
SCENE ILLUMINATION IS UNREALISTICALLY LOW AND THAT
.135 F.C.S. IS A MORE PRACTICAL VALUE. THE
ADVANTAGES OF UPWARD CARTRIDGE EJECTION ARE FULLY
SUBSTANTIATED. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-258 576

OGDEN AIR MATERIEL AREA HILL AFB UTAH

SIGNAL DISTRESS MK 13 MOD 0

(U)

MAY 61 1V SINGER, LIPMAN M.:
REPT. NO. TR61 20
MONITOR: 00Y TR61 20

UNCLASSIFIED REPORT

DESCRIPTORS: *DISTRESS SIGNALS, *PYROTECHNICS, *SIGNALS,
DESIGN, FLARES, SMOKES, TESTS (U)

THREE LOTS OF MK 13 MOD 0 SMOKE AND ILLUMINATION SIGNALS WERE SUBJECTED TO PHYSICAL TESTS BECAUSE OF AN EMERGENCY UNSATISFACTORY REPORT FROM A USING COMMAND. A TOTAL OF 127 SIGNALS WERE SUBJECTED TO VISUAL INSPECTION, LEAK TESTS, 24-HOUR WATER SOAK TESTS, TENSION TESTS, AND HAND FUNCTION TESTS. THE SOLDER ON THE PULL DISK WAS QUANTITATIVELY ANALYZED FOR TIN, LEAD, AND BISMUTH. THIS INVESTIGATION REVEALED THAT THE SPOT WELDS AND PULL RINGS OF ALL LOTS DID NOT MEET SPECIFICATION REQUIREMENTS. SOME SIGNAL CASES WERE NOT WATER-TIGHT. AN EXCESSIVE AMOUNT OF GLUE WAS USED TO HOLD THE PAPER CAPS TO THE SIGNAL. IT WAS RECOMMENDED THAT A DESIGN CHANGE BE MADE TO REQUIRE 2 SPOT WELDS ON THE METAL CAPS IN LIEU OF ONE. IT WAS ALSO RECOMMENDED THAT ADDITIONAL TESTS BE INCLUDED FOR THE PULL RING, THE PULL DISK, THE SPOT WELDS, AND THE WATER-TIGHTNESS OF THE SIGNAL CASE. A QUALITY LEVEL OF 0.34% WOULD BE USED IN THESE TESTS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-258 725

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

DETERMINATION OF SENSITIVITY TO IMPACT OF PYROTECHNIC
FLASH COMPOSITIONS USING MODIFIED PICATINNY ARSENAL
IMPACT TEST (U)

JUN 61 17P HARRIS, JOEL; EDELMAN, DAVID J.; KAYE,
SEYMOUR M.;
REPT. NO. TN20
PROJ: TS5-5407

UNCLASSIFIED REPORT

DESCRIPTORS: *ALUMINIZED EXPLOSIVES, *PYROTECHNICS,
AGING (PHYSIOLOGY), ALUMINUM, CALCIUM, CALCIUM
COMPOUNDS, COATINGS, DETONATIONS, FUELS, HUMIDITY,
IMPACT SHOCK, PERCHLORATES, POTASSIUM COMPOUNDS,
SENSITIVITY, TEMPERATURE (U)

RUN-DOWN IMPACT SENSITIVITY TESTS WERE CONDUCTED ON
FP-790 (30/20/50 CA/AL/KClO₄),
CONTAINING EITHER ELEMENTAL OR CaCO₃-COATED CA
AND 60/40 KClO₄/AL. THE EFFECTS OF FUEL
PARTICLE SIZE, AGING OF THE COMPOSITION AFTER
BLENDING, EXPOSURE OF THE COMPOSITION TO 75% RH
OVER VARIOUS TIME INTERVALS, AND COMPOSITION
TEMPERATURE WERE INVESTIGATED. FLASH COMPOSITIONS
CONTAINING CA AS FUEL WERE MORE IMPACT SENSITIVE
THAN THOSE CONTAINING ATOMIZED AL. THE SYSTEMS
CONTAINING CA ALSO EXHIBITED THE MOST MARKED
INCREASE IN IMPACT SENSITIVITY ON HEATING TO 110 C.
NO TREND IN IMPACT SENSITIVITY WAS APPARENT DUE TO
FUEL PARTICLE SIZE. AGING OF THE COMPOSITIONS IN
SEALED CONTAINERS FOR 1 MO RESULTED IN A VERY SLIGHT
INCREASE IN IMPACT SENSITIVITY, WHILE EXPOSURE TO
75% RH CAUSED A MARKED DECREASE IN IMPACT
SENSITIVITY. THE SUBSTITUTION OF CA-AL ALLOY
FOR THE INDIVIDUAL FUEL INGREDIENTS IN FP 790
RESULTED IN A SLIGHT INCREASE IN IMPACT SENSITIVITY.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-261 349

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

SYSTEMS ANALYSIS OF CLOVER CARTRIDGE.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE.

JUL 61 19P

EDELMAN, DAVID J. ; KAYE,

SEYMOUR M. ;

REPT. NO. FRL-TN-28

PROJ: TS5-5407

UNCLASSIFIED REPORT

DESCRIPTORS: *DETONATIONS , *PHOTOFLASH CARTRIDGES ,
ALUMINUM , AZIDES , CALCIUM , CARTRIDGES , HEAT , HIGH
ALTITUDE , INTERIOR BALLISTICS , LEAD COMPOUNDS ,
PERCHLORATES , POTASSIUM COMPOUNDS , SENSITIVITY ,
STYPHNATES , TEST METHODS , TESTS

(M)

A SYSTEMS ANALYSIS OF THE CLOVER FLASH CARTRIDGE
REVEALED THAT, OF ALL COMPONENTS PRESENT, THE LEAD
AZIDE AND LEAD STYPHNATE EXHIBIT THE LOWEST IGNITION
TEMPERATURES ON FURNACE HEATING OF TEST CARTRIDGES.
SKIN TEMPERATURE DURING THE LAUNCHING OF A CLOVER
CARTRIDGE ASSEMBLY WAS FOUND TO BE APPROXIMATELY 120
C, FAR BELOW THE IGNITION TEMPERATURE OF ANY OF THE
CARTRIDGE COMPONENTS. ADDITIONAL ASSEMBLIES WERE
PREHEATED TO TEMPERATURES OF 120 AND 140 C, AND
SERIES FIRED. CARTRIDGE SKIN TEMPERATURES OF 200
AND 270 C, RESPECTIVELY, WERE OBTAINED. ALL
CARTRIDGES FIRED IN SEQUENCE WITH NO MALFUNCTIONS.
IT WAS THUS ESTABLISHED THAT NONE OF THE COMPONENTS
ARE PREMATURELY IGNITED BY HEAT GENERATED DURING
LAUNCHING. X-RAY EXAMINATION SHOWED NO
DISCONTINUITIES IN COMPONENT PACKING, AND 40 FT FREE
FALL TESTS DID NOT CAUSE DETONATION OF CARTRIDGES
CONTAINING FP 790 ONLY. A POSSIBLE EXPLANATION
OF THE PREMATURE DETONATIONS OBTAINED DURING SERIES
FIRINGS IS GIVEN BASED UPON OMISSION OF THE BLACK
POWDER/BARIUM CHROMATE EXPPELLING CHARGE.
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-263 202

OGDEN AIR MATERIEL AREA HILL AFB UTAH

SERVICEABILITY OF SIGNAL, SMOKE, AND ILLUMINATION,
AIRCRAFT, AN-MK 5 MOD 4 (U)

SEP 61 IV SCHNABEL, JOHN H.:
REPT. NO. TR61 35
MONITOR: OGY TR61 35

UNCLASSIFIED REPORT

DESCRIPTORS: *ILLUMINATING PROJECTILES, *SIGNALS,
*SMOKES, AIRCRAFT, STORAGE, TESTS (U)

TESTS WERE CONDUCTED TO DETERMINE THE SERVICEABILITY OF THE AN-MK 5 MOD 4 SIGNAL. ALL SIGNALS WERE VISUALLY INSPECTED FOR DEFECTS, TEN WERE DISASSEMBLED FOR INTERNAL INSPECTION, AND 60 WERE FUNCTION TESTED. THE FUNCTION TESTS CONSISTED OF DROPPING THE SIGNALS INTO A BODY OF WATER 20 FT IN DEPTH FROM AN AIRCRAFT AT AN ALTITUDE OF 500 FT AND AN AIR SPEED OF 150 KNOTS. THROUGH VISUAL INSPECTION, ALL SIGNALS APPEARED TO BE MATERIALLY SATISFACTORY AND ALL INTERNAL COMPONENTS IN GOOD CONDITION. OF THE 60 SIGNALS FUNCTION TESTED, TWO FAILED TO FUNCTION, TWO EMITTED SMOKE AND FLAME LESS THAN THE REQUIRED 10 MIN, AND EIGHT HAD A SMOKE DENSITY OF LESS THAN ONE-HALF OF NORMAL. FOUR OF THE FIVE LOTS TESTED WERE SERVICEABLE. BASED ON THE 60 SIGNALS TESTED, AT A 95% CONFIDENCE LEVEL, THE FUNCTIONAL RELIABILITY IS BETWEEN 88% AND 100%. BASED ON THE FOUR SERVICEABLE LOTS (42 SIGNALS), AT A 95% CONFIDENCE LEVEL, THE FUNCTIONAL RELIABILITY IS BETWEEN 92.8% AND 100%. IT IS RECOMMENDED THAT LOT NAD 4132-C-56 BE SUSPENDED FROM ISSUE AND USE BECAUSE OF THE EXCESSIVE NUMBER OF DUDS IN THIS LOT. (AUTHOR) (U)

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AD-266 364

CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL
MD

COMPARISON OF DECHLORANE AND HEXACHLOROETHANE IN
SMOKESCREEN COMPOSITIONS

(U)

AUG 61 1V REAVES, WOODROW W.; CARLON, KENNETH G.;
REPT. NO. SPI 27

UNCLASSIFIED REPORT

DESCRIPTORS: *ETHANES (2 C), *PYROTECHNICS, *SMOKE
SCREENS, *SMOKES, CHLORIDES, COMBUSTION, DENSITY,
DISEASES, GRENADES, HYDROCARBONS, LABORATORY ANIMALS,
LUNGS, MELTING, PATHOLOGY, POLYCYCLIC COMPOUNDS,
RESPIRATORY SYSTEM, RETARDING-FIELD OSCILLATORS,
STABILITY, TOXICITY, VOLUME

(U)

A COMPARISON OF TWO SMOKESCREEN COMPOSITIONS,
DECHLORANE AND HEXACHLOROETHANE, WAS MADE WITH
RESPECT TO SMOKE VOLUME, BURNING TIME, STORAGE
STABILITY, AND TOXICITY. THE SMOKE VOLUME AND
BURNING TIME OF THE DECHLORANE COMPOSITION ARE
COMPARABLE TO HC COMPOSITIONS. ITS STORAGE
STABILITY IS SUPERIOR TO STANDARD HC COMPOSITIONS.
NO SIGNIFICANT DIFFERENCE IN RELATIVE TOXICITY
BETWEEN THE SMOKE CLOUDS FROM THE TWO COMPOSITIONS
WAS FOUND; BOTH SMOKES PRODUCE CHRONIC PATHOLOGICAL
DEGENERATION OF TISSUES OF THE RESPIRATORY SYSTEM.
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-266 368 -

PICATINNY ARSENAL DOVER N. J. FELTHAN RESEARCH LABS

TITAN FLASH CARTRIDGE

(U)

OCT 61 IV LEACH, J. WENDELL
REPT. NO. TR33

UNCLASSIFIED REPORT

DESCRIPTORS: *PHOTOFLASH CARTRIDGES, DESIGN, GUIDED
MISSILES, LIGHT, POSITION FINDING, PRODUCTION,
PYROTECHNICS, SATELLITES (ARTIFICIAL), TESTS, UPPER
ATMOSPHERE (U)
IDENTIFIERS: TITAN (U)

EXTENSIVE STATIC AND BALLISTIC TESTING DEMONSTRATED
THAT THE TITAN FLASH CARTRIDGE MEETS THE SPECIFIED
REQUIREMENTS. THE EJECTION DISTANCE IS 65 FT
WITHIN 2 SIGMA LIMITS OF \pm OR \pm 15 FT, AND THE
CANDLESECOND VALUE EXCEEDS 120,000. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-266 486

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

EFFECT OF FUEL AND OXIDANT PARTICLE SIZE ON THE
PERFORMANCE CHARACTERISTICS OF 60/40 POTASSIUM
PERCHLORATE/ALUMINUM FLASH COMPOSITION (U)

NOV 61 1V KAYE, SEYMOUR M. HARRIS, JOEL;
REPT. NO. TR44

UNCLASSIFIED REPORT

DESCRIPTORS: •ALUMINUM, •PERCHLORATES, •POTASSIUM
COMPOUNDS, •PYROTECHNICS, CARTRIDGES, EFFECTIVENESS,
FUELS, HIGH ALTITUDE, LOADING, LUMINESCENCE, MATERIALS,
MIXTURES, OXIDIZERS, PARTICLES, PHYSICAL PROPERTIES,
POWDER METALS, SIMULATION, THERMOCHEMISTRY (U)

SUB-SIEVE KClO₄ AND ATOMIZED AL POWDERS,
COMMERCIALY CLASSIFIED INTO FINE, MEDIUM AND COARSE
FRACTIONS, WERE BLENDED IN 60/40 KClO₄/AL
COMPOSITIONS, LOADED INTO PLASTIC TITAN CARTRIDGE
CASES, AND TESTED FOR LUMINOSITY CHARACTERISTICS AT
SEA LEVEL AND A SIMULATED ALTITUDE OF 80,000 FEET.
THOSE SYSTEMS CONTAINING FINE (0-12 MICRON),
MEDIUM (0-23 MICRON), AND COARSE (6-85
MICRON) KClO₄ TOGETHER WITH FINE AL (0-17
MICRON) WERE THE ONLY SYSTEMS WHICH EMITTED ENOUGH
LIGHT FOR PYROTECHNIC APPLICATIONS. MAINTAINING
THE ALUMINUM PARTICLE SIZE CONSTANT (FINE
FRACTION) AND DECREASING THE OXIDANT PARTICLE SIZE
INCREASED EFFICIENCY (CANDLESECONDS/GRAM) AT BOTH
SEA LEVEL AND 80,000 FEET. IN GENERAL, THE PEAK
AND INTEGRAL LIGHT VARIED SIMILARLY AT HIGH ALTITUDE.
AT SEA LEVEL, HOWEVER, THE COMPOSITION WITH THE
COARSE OXIDANT FRACTION PRODUCED THE HIGHEST PEAK AND
INTEGRAL LIGHT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-267 653

NAVAL AMMUNITION DEPOT CRANE IND

QUANTITATIVE CHEMICAL ANALYSIS OF A GREEN SMOKE
COMPOSITION (U)

JUL 61 IV RIPLEY, WILLIAM; NEED, VANCE;
REPT. NO. RDTR 22

UNCLASSIFIED REPORT

DESCRIPTORS: *COLORED SMOKE, *DYES, *PYROTECHNICS,
*SMOKES, AMIDES, ANTHRACENES, CARBONATES, CHEMICAL
ANALYSIS, CHLORATES, DIOXIDES, FLUORIDES, GOLD
COMPOUNDS, GRAVIMETRIC ANALYSIS, HYDROGEN COMPOUNDS,
MIXTURES, POLAROGRAPHIC ANALYSIS, POTASSIUM COMPOUNDS,
QUANTITATIVE ANALYSIS, QUINONES, SILICON COMPOUNDS,
SODIUM COMPOUNDS, SPECTROGRAPHIC ANALYSIS, STARCHES,
SUCROSE, TOLUIDENES, VOLUMETRIC ANALYSIS (U)

THE QUANTITATIVE ANALYSIS OF A SMOKE COMPOSITION OF
GREEN DYE (A MIXTURE OF 1,4-DI-P-
TOLUIDINOANTHRAQUINONE AND AURAMINE HYDROCHLORIDE),
POWDERED SUGAR CONTAINING APPROXIMATELY 3% STARCH,
POTASSIUM CHLORATE, SODIUM BICARBONATE, SILOCEL, AND
COLLOIDAL SILICON DIOXIDE BINDER IS DESCRIBED.
COMPONENTS SOLUBLE IN WATER MADE SLIGHTLY ALKALINE
ARE REMOVED AND ANALYZED. SILICA IS ISOLATED
AS A INSOLUBLE COMPONENT, IGNITED, AND DETERMINED
GRAVIMETRICALLY. THE % OF VOLATILES IS FOUND
GRAVIMETRICALLY BY MEANS OF VACUUM DRYING. 1,4-DI-P-
TOLUIDINOANTHRAQUINONE AND AURAMINE HYDROCHLORIDE ARE
DETERMINED SPECTROPHOTOMETRICALLY. STARCH IS
ESTIMATED FROM THE % SUCROSE FOUND. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-268 666

PENNSYLVANIA UNIV PHILADELPHIA

PHYSICAL PROPERTIES OF INSULATORS MOLECULAR CRYSTALS
AND MAGNETIC MATERIALS (U)

MAR 61 1V CASPARI, MAX E.
CONTRACT: AF33 616 6640
MONITOR: ASD TN61 53

UNCLASSIFIED REPORT

DESCRIPTORS: *CHLORIDES, *CRYSTALS, *ELECTRIC
INSULATION, *MAGNETIC MATERIALS, *MARKERS, *POTASSIUM
COMPOUNDS, *SMOKE PROJECTILES, ABSORPTION, CRYSTAL
LATTICES, DILATOMETERS, ELECTRIC FIELDS, EXCITATION,
IODINE, IONIZATION, LABORATORY EQUIPMENT, LOW
TEMPERATURE RESEARCH, MAGNETIC FIELDS, MAGNETOMETERS,
MOLECULAR STRUCTURE, OPTICS, PHOTOCONDUCTIVITY,
PHOTOELASTICITY, PHYSICAL PROPERTIES, RADIATION EFFECTS,
SENSITIVITY, SPECTROPHOTOMETERS, X RAYS (U)

RESEARCH IS BEING CARRIED OUT ON THE DETERMINATION
OF THE PHYSICAL PROPERTIES OF ALKALI HALIDES,
MOLECULAR CRYSTALS AND MAGNETIC MATERIALS. THE
RESEARCH ON ALKALI HALIDES INVOLVES THE CREATION OF
POINT IMPERFECTIONS BY WEAK IONIZING RADIATIONS. A
STUDY OF THE EXPANSION AND F CENTER CONCENTRATION
IN ALKALI HALIDES INDUCED BY X-RAY IRRADIATION OF
RELATIVELY WEAK INTENSITIES WAS MADE. THE
IONIZATION OF EXCITED F CENTERS BY ELECTRIC FIELDS
WAS DETECTED BY MEASURING THE CHANGE IN THE F -
CENTER CONCENTRATION WHEN ADDITIVELY COLORED CRYSTALS
WERE IRRADIATED IN THE F BAND AT LIQUID N
TEMPERATURES AND AN ELECTRIC FIELD WAS APPLIED
SIMULTANEOUSLY. THESE EXPERIMENTS WERE DESIGNED TO
GIVE INFORMATION AS TO WHETHER THE IONIZATION COULD
BE CONSIDERED A ZENER TYPE TUNNELING OR AN IMPACT
IONIZATION PROCESS. WORK ON MOLECULAR CRYSTALS IS
PRESENTED AND RESULTS ON THE PHOTOCONDUCTIVITY OF 1
SINGLE CRYSTALS ARE REPORTED. THE DESIGN OF A
FONER TYPE MAGNETOMETER AND A TORSION ANISOTROPY
APPARATUS IS DESCRIBED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-268 982

CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL
MD

DEVELOPMENT OF A NONHAZARDOUS TECHNIQUE FOR
QUANTITATIVELY EVALUATING THE INHALATION
EFFECTIVENESS OF CW MUNITIONS

(U)

AUG 61 1V WHITNEY, FRANK C.; PENN, MITCHELL E.;
REPT. NO. 3062

UNCLASSIFIED REPORT

DESCRIPTORS: *BREATHING MASKS, *SAFETY DEVICES, *SMOKES,
AEROSOL GENERATORS, AEROSOLS; CHEMICAL WARFARE AGENTS,
DOSAGE, GRENADES, MILITARY PERSONNEL, PYROTECHNICS,
RESPIRATION

(U)

A TECHNIQUE FOR QUANTITATIVELY EVALUATING THE
INHALATION EFFECTIVENESS OF CW MUNITIONS AS PART OF
THE OVER-ALL CARAMU PROGRAM WAS INVESTIGATED. A M
THOD FOR INSTANTANEOUSLY GENERATING A NONTOXIC CLOUD
OF FINE AEROSOL IN A NONHAZARDOUS MANNER WAS
DEVELOPED. A PUFF-TYPE, ELECTRICALLY ACTIVATED
GRENADE CONTAINING A MIXTURE OF 2,4DIHYDROXY
BENZOPHENONE AND A PYROTECHNIC FUEL WAS DESIGNED AND
TESTED. AN ORONASAL MASK WAS EMPLOYED AS ONE OF
THE PRIMARY ELEMENTS OF THE SYSTEM. DATA OBTAINED
FROM LABORATORY EXPERIMENTS ON THE FINE AEROSOL
CLOUD-ORONASAL MASK SYSTEM ARE DESCRIBED. IT WAS
CONCLUDED THAT THE PUFF-TYPE GRENADE-ORONASAL MASK
SYSTEM PROVIDES A TECHNICALLY FEASIBLE METHOD FOR
QUANTITATIVELY EVALUATING THE INHALATION
EFFECTIVENESS OF THE CLOUD WHICH WOULD BE PRODUCED BY
CW MUNITIONS. THE SYSTEM COULD BE EMPLOYED AS
PART OF THE CARAMU PROGRAM. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-270 498

UNIVERSAL MATCH CORP ST LOUIS MO

PERFORMANCE TEST UNDER LABORATORY CONDITIONS OF LAU-
25/A(XN-1) FLARE LAUNCHER EJECTION SYSTEM (U)

DEC 61 19P
REPT. NO. TR102 10
CONTRACT: NOW-61-0514

UNCLASSIFIED REPORT

DESCRIPTORS: *AIRCRAFT FLARES, *PYROTECHNIC PROJECTORS,
EJECTION, TESTS (U)
IDENTIFIERS: AERO-5 FIRE CONTROL SYSTEMS (U)

THE PERFORMANCE TEST OF THE LAU-25/A(XN-1)
FLARE LAUNCHER EJECTION AND RETENTION MECHANISM HAS
BEEN SUCCESSFULLY COMPLETED WITH ALL COMPONENTS
FUNCTIONING SATISFACTORILY. THE TEST WAS MADE TO
DEMONSTRATE THAT ALL OF THE COMPONENTS OF THE
EJECTION MECHANISM WOULD FUNCTION PROPERLY PRIOR TO
INCORPORATION INTO THE FINAL DESIGN. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-271 439

GEONAUTICS INC WASHINGTON D-C

PHOTOGRAMMETRIC FLASH TRIANGULATION FOR CORPS OF
ENGINEERS FIELD USE

(U)

AUG 61 1V EICHORN, HEINRICH K. I
CONTRACT: DA44 009ENG4646

UNCLASSIFIED REPORT

DESCRIPTORS: *ASTRONOMICAL GEODESICS, *BRIDGES,
*MAPPING, *MATRIX ALGEBRA, *PHOTOFLASH BOMBS, CONTROL
SYSTEMS, DATA PROCESSING SYSTEMS, ERRORS, GEODESICS,
HIGH ALTITUDE, MATHEMATICAL ANALYSIS, PHOTOGRAMMETRY,
POSITION FINDING, RANGES (DISTANCE), SOUNDING ROCKETS,
TRIGONOMETRY (U)
IDENTIFIERS: ARCAS (U)

METRY, ARCAS, PHOENIX. ERROR ANALYSIS WAS
CONTINUED OF THE PROPOSED PHOTOGRAMMETRIC FLASH
TRIANGULATION FOR ARMY USE IN EXTENDING GEODETIC
CONTROL OVER SHORT AND MEDIUM RANGES. THE PROPOSED
FIELD INSTRUMENTATION SYSTEM UNDER CONSIDERATION IS
BASED ON THE USE OF PORTABLE CAMERAS AND ADJUSTABLE
EQUATORIAL MOUNTS FOR GUIDING ON THE STAR BACKGROUND
DURING THE OBSERVATIONS. THE MAIN ADVANTAGE IS
THAT THE FIELD OPERATIONS DO NOT REQUIRE THE TIMES OF
THE OCCURRENCE OF THE FLASHES OR THE PHOTOGRAPHIC
EXPOSURES. ANALYTICAL METHODS ARE DEVELOPED FOR A
RIGOROUS LEAST SQUARES ADJUSTMENT OF REDUNDANT
OBSERVATIONAL DATA. THE RESULTS OF AN ERROR
ANALYSIS OF A REDUNDANT HYPOTHETICAL CONFIGURATION
USING TWO KNOWN STATIONS, FIVE UNKNOWN AND TWO FLASH
POINTS ARE THEN PRESENTED TO PROVIDE AN INDICATION OF
THE EXPECTED ACCURACY OF THE OBSERVATION TECHNIQUES.
CONCLUSIONS AND RECOMMENDATIONS ARE PRESENTED FOR
FUTURE EVALUATION OF THE PROPOSED FLASH TRIANGULATION
SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-272 580

NAVAL RESEARCH LAB WASHINGTON D C

CHLORATE-CANDLE FABRICATION BY HOT PRESSING. (U)

DESCRIPTIVE NOTE: FINAL REPT.

JAN 62 18P GUSTAFSON, P. R. SMITH, S.
H. , JR. MILLER, R. R. ;
REPT. NO. NRL-5732

UNCLASSIFIED REPORT

DESCRIPTORS: •CHLORATES , •PYROTECHNICS , •SODIUM
COMPOUNDS , BARIUM COMPOUNDS , BINDERS , CHEMICAL REACTIONS
, COMBUSTION , DECOMPOSITION , DENSITY , DIOXIDES , FIBERS ,
GLASS TEXTILES , HIGH-PRESSURE RESEARCH , IRON ,
MANUFACTURING METHODS , METALLIC TEXTILES , MOLDING ,
OXYGEN , POWDER METALS , PRODUCTION , SUBMARINES (M)

AN INVESTIGATION SHOWED DISTINCT ADVANTAGES TO
MANUFACTURING CHLORATE CANDLES BY A HOT-PRESSING
TECHNIQUE, OMITTING WATER AS A BINDER. SMALL
QUANTITIES OF WATER TRAPPED IN A CHLORATE CANDLE CAN
RESULT IN THE PRODUCTION OF SIGNIFICANT QUANTITIES OF
CHLORINE. BY THE HOT-PRESSING METHOD, HIGH-DENSITY
CANDLES (2.5 G/CC) WERE PRODUCED WHICH YIELD THE
EQUIVALENT OF 200 CU FT OF OXYGEN (STP) FROM 490 CU
IN. OF CANDLE VOLUME. TWO METHODS CAN BE USED FOR
FORMING CANDLES: MOLDING AND EXTRUSION. MOLDED
CANDLES ARE BEST FORMED AT TEMPERATURES FROM 225 TO
245 C AT PRESSURES FROM 10,000 TO 5000 PSI,
RESPECTIVELY. A DOUBLE-ACTION RAM CAN BE USED;
WITH A SINGLE-ACTION RAM, SUCCESSIVE PRESSING
INCREMENTS SHOULD BE USED TO AVOID UNEVEN
DISTRIBUTION OF DENSITY. USE OF A GLASS-WOOL
BLANKET OR OVEN ANNEALING IS RECOMMENDED TO AVOID
THERMAL STRESSES ON COOLING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-273 042

HARRY DIAMOND LABS WASHINGTON D C

PYROTECHNIC RESEARCH AT DOFL. PART II. PYROTECHNIC
DELAYS (U)

FEB 62

IV

COMYN, RAYMOND H. I

UNCLASSIFIED REPORT

DESCRIPTORS: *DELAY ELEMENTS (EXPLOSIVE), *PYROTECHNICS,
BARIUM COMPOUNDS, BOMB FUZES, CHROMATES, COMBUSTION,
DESIGN, HEATING ELEMENTS, IGNITERS, IRON COMPOUNDS, LEAD
COMPOUNDS, MANGANESE COMPOUNDS, MATERIALS, OXIDES,
PRIMERS, STABILITY, STORAGE, TEST METHODS, TESTS,
ZIRCONIUM COMPOUNDS (U)

PYROTECHNIC DELAY INVESTIGATIONS AT DOFL FOR THE
PAST SEVERAL YEARS ARE REVIEWED. STUDIES INCLUDE
T2, T5, AND T6 DELAY ELEMENTS; DELAY IGNITION;
FAST AND SLOW BURNING COMPOSITIONS; STORAGE STABILITY
OF MIXTURES; METHODS FOR MEASURING GAS AND HEAT
EVOLVED BY THESE COMPOSITIONS; MIXING PROCEDURES; AND
NEW METHODS FOR EMPLOYING PYROTECHNIC MIXTURES FOR
PRODUCING TIME DELAYS. THE BURNING TIME
DISPERSIONS, OVER THE TEMPERATURE RANGE -65 F TO +
165 F, WILL BE AT LEAST + OR 12 PERCENT UNDER
OPTIMUM CONDITIONS FOR DELAYS BURNING WITHIN 20 SEC
AND MAY BE TWICE THIS VALUE FOR LONGER DELAYS OR WHEN
CONDITIONS ARE LESS FAVORABLE. THE PRESENT
COMPOSITIONS APPEAR TO BE SATISFACTORY FOR CURREN
OFL REQUIREMENTS AND NO FURTHER INVESTIGATIONS ARE
RECOMMENDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-276 489

NORTHEASTERN UNIV BOSTON MASS ELECTRONICS RESEARCH
LAB

S-BAND BEACON PRF COMMAND SYSTEM

(U)

DEC 61 1V O'CONNOR, L.J.; SUKYS, R.;

UNCLASSIFIED REPORT

DESCRIPTORS: *COMMAND + CONTROL SYSTEMS, *ELECTRIC
IGNITERS, *PYROTECHNICS, *RADAR BEACONS, *SMOKE
MUNITIONS, *WARHEADS, CIRCUITS, CLOUDS, COLLECTING
METHODS, FIRING CIRCUITS, IGNITION, METEOROLOGY,
RADIOFREQUENCY FILTERS, RELEASE MECHANISMS, S BAND,
SOLID STATE PHYSICS, TESTS, UPPER ATMOSPHERE
IDENTIFIERS: AEROBEE H1, AN/DPN-41, ASTROBEE

(U)

(U)

WORK WAS DONE ON AN S-BAND BEACON PRF COMMAND
SYSTEM. THIS SYSTEM IS TO PROVIDE THE CAPABILITY
OF PERFORMING AN EVENT AT A PREDETERMINED ALTITUDE
WITHIN AN ACCURACY OF 1 KM. BY CHANGING THE AN/DPN-
41 S-BAND BEACON PRF FROM A NORMAL MODE OF 410 PPS
TO A COMMAND MODE OF 365 PPS. THE COMMAND IS
MANUALLY OPERATED AT THE RADAR SITE AND INITIATED
WHEN THE VEHICLE CROSSES PREDETERMINED GRIDS SET UPON
THE PLOTTING BOARD. THE FINAL AIRBORNE SYSTEM IS
COMPLETELY SOLID STATE AND FEATURES A UNIQUE
DETECTION METHOD OF A CHANGE IN PRF. IN THE EVENT
OF A BEACON LINK FAILURE, INTERNAL CIRCUITRY IS
PROVIDED TO ACTUATE THE OUTPUT CIRCUIT TO FIRE A
SQUIB OR OTHER DEVICE AT AN ALTERNATE TIME. TWO
TYPES OF FILTERS ARE DISCUSSED FOR DETECTION OF
CHANGES IN PRF. THE FIRST, AN ACTIVE FILTER USING
VACUUM TUBES, WAS FOUND TO BE SENSITIVE TO CHANGES IN
THE AMPLITUDE OF THE BEACON PULSE AND TOO CRITICAL
WITH REGARD TO COMPONENT VALUES. THESE FINDINGS
WERE THE RESULT OF FIELD TESTS AND LED TO THE
DEVELOPMENT OF A SECOND VERSION WHICH BASICALLY
CONSISTS OF A MONOSTABLE MULTIVIBRATOR AND ASSOCIATED
CIRCUITRY. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-282 763

MALAKER LABS INC HIGH BRIDGE N J

DETERMINING A METHOD TO INHIBIT THE INTERACTION OF
ALKALI PERCHLORATE AND WATER (U)

FEB 62 1V ANDERSON, C.J.; DEL GROSSO, R.;
REPT. NO. CM 106 8
CONTRACT: DA36 039SC3202

UNCLASSIFIED REPORT.

DESCRIPTORS: *PHYSICAL CHEMISTRY, *POWDERS,
*PYROTECHNICS, *WATER, ALUMINUM, AMMONIUM COMPOUNDS,
CALCIUM COMPOUNDS, CARBONATES, FLUORIDES, INORGANIC
COMPOUNDS, MAGNESIUM, METAL COATINGS, NITRATES, ORGANIC
COATINGS, PERCHLORATES, TEST METHODS (U)

THE STUDY WAS CONTINUED DURING THIS REPORT PERIOD,
WITH THE EMPHASIS ON CALCIUM NITRATE. THE BASIC
APPROACH WAS TO PROTECT THE POWDER WITH A COATING.
ATTEMPTS WERE MADE TO COAT THE POWDER WITH
MAGNESIUM, ALUMINUM, CARBONATE, FLUORIDE, AND
SEVERAL ORGANIC MATERIALS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-283 297

NAVAL AMMUNITION DEPOT CRANE IND

CHEMICAL ANALYSIS OF YELLOW SMOKE MIXTURE VISIBILITY
INVESTIGATION OF SMOKES AND FLARES (U)

JUL 62 IV MCGRIFFIN, JAMES I
REPT. NO. RDTR30

UNCLASSIFIED REPORT

DESCRIPTORS: *CHEMICAL ANALYSIS, *FLARES, *SMOKES,
BICARBONATES, CARBONATES, CHLORATES, CHLORIDES, COLORED
SMOKES, COPPER COMPOUNDS, DIOXIDES, HYDROXIDES,
INDANTHRENE, OXIDES, POTASSIUM COMPOUNDS, PYROTECHNICS,
QUANTITATIVE ANALYSIS, SILICON COMPOUNDS, SILVER
COMPOUNDS, SODIUM COMPOUNDS, SUCROSE (U)

A SCHEME FOR THE CHEMICAL ANALYSIS OF SMOKES AND
FLARES (YELLOW SMOKE MIXTURE) CONSISTS OF AN
AQUEOUS EXTRACTION OF $KClO_3$, SUGAR, AND
 $NaHCO_3$. SUCROSE IS OBTAINED BY INVERTING IT TO
FRUCTOSE AND GLUCOSE, WHICH ARE REDUCING
MONOSACCHARIDES. THESE ARE REACTED WITH FEHLING'S
SOLUTION TO PRECIPITATE Cu_2O , WHICH IS WEIGHED
QUANTITATIVELY. $KClO_3$ IS REDUCED TO THE Cl^- ION
AND PRECIPITATED AS $AgCl$. $NaHCO_3$ IS REACTED
WITH AN EXCESS OF HCl AND THE EXCESS IS BACK
TITRATED WITH $NaOH$. INDANTHRENE GOLDEN
YELLOW GK AND BENZANTHRONE ARE DETERMINED
SPECTROPHOTOMETRICALLY. SILOCEL AND CABOSIL,
WHICH ARE BOTH SiO_2 , ARE REPORTED AS TOTAL
 SiO_2 . AFTER THE WATER SOLUBLE CHEMICALS ARE
REMOVED, THE REMAINING MATERIAL WHICH IS SiO_2 IS
IGNITED TO CONSTANT WEIGHT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-284 794

NAVAL AMMUNITION DEPOT CRANE IND

INVESTIGATION OF VISIBILITY AND FORMULATION OF
"ASHLESS BLUE FLARE"

(U)

AUG 62 1V MCGRIFFIN, JAMES; RIPLEY, WILLIAM;
REPT. NO. RDTR 31

UNCLASSIFIED REPORT

DESCRIPTORS: *COLORED FLARES, *FLARES, AMMONIUM
COMPOUNDS, COPPER, DESIGN, PARTICLES, PERCHLORATES,
STEARIC ACIDS, TESTS, VISIBILITY, WAXES (U)

INVESTIGATIONS WERE CONDUCTED FOR THE DEVELOPMENT OF
A FEASIBLE BLUE FLARE FORMULA WITH THE REMAINING ASH
RESIDUE BEING AS SMALL AS POSSIBLE. A VERY
PROMISING FORMULA WAS DEVELOPED CONTAINING COPPER
DUST AS THE MOLECULAR EMITTER, AMMONIUM PERCHLORATE,
STEARIC ACID, AND PARAFFIN. ALL OF THE PHYSICAL
AND CHEMICAL TESTS PERFORMED IN ESTIMATING THE
FEASIBILITY OF USING THE PROPOSED FORMULA IN AN
OPERATIONAL SIGNAL ARE PRESENTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-285 047

MILLER RESEARCH CORP BALTIMORE MD

PRODUCTION COMPONENTS FOR CARTRIDGE, 81 MM,
ILLUMINATING T214E2

(U)

SEP 62 1V BRIGGEMAN, E.R.
REPT. NO. PR 251 8 62
CONTRACT: DA36 0340RD3468

UNCLASSIFIED REPORT

DESCRIPTORS: •ILLUMINATING PROJECTILES, CARTRIDGES,
PLASTICS, TESTS

(U)

IDENTIFIERS: T-214 CARTRIDGES, 81-MM

(U)

MANUFACTURE OF THE TAIL CONE WAS INITIATED, AND
DELIVERY OF THE RAW IMPACT EXTRUSIONS IS EXPECTED
DURING SEPTEMBER. THE INITIAL TAIL CONE HAD A
WALL THICKNESS OF 0.24 IN., AND SINCE IT DEMONSTRATED
MORE THAN ADEQUATE STRENGTH, AN INVESTIGATION WAS
BEGUN TO DETERMINE IF THE WEIGHT COULD BE REDUCED
FURTHER. TESTS ON A GROUP OF 10 TAIL CONES WITH A
0.21 IN.-WALL INDICATE ADEQUATE STRENGTH.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-286 448

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

EFFECTS OF CASE COATING ON LOADING AND BURNING
CHARACTERISTICS OF EXPERIMENTAL ILLUMINANTS FOR XM-
145 AND XM-146 GROUND SIGNALS (U)

OCT 62 1V KRISTAL, JOSEPH; WERBEL, BURTON;
REPT. NO. TM1083

UNCLASSIFIED REPORT

DESCRIPTORS: *COLORED FLARES, *FLARES, *PYROTECHNICS,
COATINGS, COLORS, GRAPHITE, LOADING, PLASTICS, SIGNALS,
TESTS, WAXES (U)

STATIC PERFORMANCE TESTS WERE CONDUCTED IN FLARE
COMPOSITIONS PRODUCING RED AND YELLOW LIGHT, USING
CONVOLUTE-WOUND FILTER PAPER CASES WITH THE XM-146
YELLOW LIGHT SYSTEMS AND CONVOLUTEWOUND KRAFT PAPER
WITH THE RED LIGHT XM-145 SYSTEMS. THESE CASES
WERE 3.83 IN. LONG AND HAD AN INNER DIAM OF 1.19 IN.
RESULTS WERE COMPARED ON THE BASIS OF THE DECISIVE
PARAMETERS OF IGNITION CHARACTERISTICS, CANDLEPOWER,
BURNING TIME, AND EASE OF LOADING. POLYWAX (67/
33), POLYWAX (80/20), THIKOL, COAST PRO-
SEAL, AND GRAPHITE WERE INVESTIGATED AS CASE
COATINGS. CANDLEPOWER WAS FOUND TO DEPEND ON THE
TYPE OF CASE COATING USED AND THE TEMPERATURE RANGE
TO WHICH THE COATED CASES WERE SUBJECTED. BURNING
TIME WAS FOUND TO BE GENERALLY INDEPENDENT OF FACTORS
WHICH AFFECTED CANDLEPOWER. NO CASE COATING
INVESTIGATED MET ALL REQUIREMENTS. SLAG FORMATION
AND/OR CHIMNEY FORMATION, POSSIBLY CAUSE BY CASE
MATERIAL OR CASE COATING OR BOTH, COULD HAVE BEEN
RESPONSIBLE FOR OCCASIONAL SEVERE REDUCTIONS IN
CANDLEPOWER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-286 714

TACTICAL AIR COMMAND LANGLEY AFB VA

OPERATIONAL TEST AND EVALUATION-NIGHT MARKING
CAPABILITY OF THE MK-76, MK-106 AND MB-2 BOMBS (U)

OCT 62 1V HUTTO, JOSEPH L. KYLER, FREDERICK C. I
REPT. NO. TAC-TR-62-33

UNCLASSIFIED REPORT

DESCRIPTORS: *BOMBS, *FLARES, *NIGHT BOMBING, *SIGNALS,
*SMOKES, *SPOTTING CHARGES, AVIATION PERSONNEL, PILOTS,
POSITION FINDING, PYROTECHNICS, TRAINING (U)
IDENTIFIERS: MARK-76 BOMBS, 25-LB., MARK-106
BOMBS (U)

THE MARK 4 MOD 3 SPOTTING CHARGE WAS DESIGNED
FOR DAYLIGHT MARKING AND, WHEN EMPLOYED AT NIGHT WITH
THE MK-76, MK-106, MB-2 AND MB-2A BOMBS,
WILL HAVE LIMITED USE FOR DETERMINING BOMB SCORES.
BECAUSE OF THE SHORT DURATION OF THE FLASH, AND
SINCE THE SMOKE IS NOT VISIBLE AT NIGHT, THE DELIVERY
PILOT CANNOT ACCURATELY AIR SCORE HIS OWN NIGHT
BOMBING IMPACTS WITH ACCEPTABLE CONSISTENCY. A
WINGMAN OR ANOTHER PILOT ORBITING ABOVE THE TARGET
CAN SATISFACTORILY SCORE BOMB DROPS AT NIGHT IF A
METHOD FOR DETERMINING RANGE IS PROVIDED. GROUND
PERSONNEL CAN SCORE NIGHT BOMBING IMPACTS BUT WITH
LESS ACCURACY THAN A PILOT ORBITING ABOVE THE TARGET.
GROUND SCORING PERSONNEL MUST BE CONSTANTLY ALERT
DURING BOMBING MANEUVERS IN ORDER TO SEE THE BOMB
FLASH AND ALIGN THE ALIDADE BEFORE THE AFTER-IMAGE
OF THE FLASH HAS DISAPPEARED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-286 8T8

FRANKFORD ARSENAL PHILADELPHIA PA PITMAN-GUNN RESEARCH
LABS

DEVELOPMENT OF FUZE, HT, T252

(U)

AUG 62 29P FAZIO, J.;
REPT. NO. FA-R-1628
PROJ: DA-505-07-008

UNCLASSIFIED REPORT

DESCRIPTORS: •ILLUMINATING PROJECTILES, •MORTAR FUZES,
•TIME DELAY FUZES, OPERATION, TESTS (U)
IDENTIFIERS: T-214 CARTRIDGES, 81-MM, T-252 FUZES (U)

THE HT, T252 FUZE IS A 45-SECOND MECHANICAL
TIME FUZE DESIGNED TO INITIATE THE M29 PERCUSSION
PRIMER WHICH IN TURN IGNITES THE EXPLOSIVE TRAIN OF
THE T214 ILLUMINATING SHELL. THE FUZE PROVIDES
SAFETY, ARMING, TIMING AND FIRING SYSTEMS TO PERMIT
FIRING AT SELECTIVE TIME SETTINGS. TWO SOURCES WERE
EXPLORED TO PROVIDE A SELF-CONTAINED LIGHT SOURCE FOR
NIGHT SETTING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-287 544

ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

SPECIAL ROCKETS AND PYROTECHNICS PROBLEMS

(U)

JUL 61 17P THIBODAU, J.G.
REPT. NO. 396

UNCLASSIFIED REPORT

DESCRIPTORS: •PYROTECHNICS, •ROCKETS, CIRCUITS, ELECTRIC
DETONATORS, ELECTRIC IGNITERS, ELECTRIC PRIMERS,
EXPLOSIVE ACTUATORS, EXPLOSIVE BOLTS, EXPLOSIVE FORMING,
EXPLOSIVE GASES, EXPLOSIVE TRAINS, GAS GENERATING
SYSTEMS, RELIABILITY, ROCKET IGNITERS, SAFETY, TIME
DELAY FUZES (U)

IDENTIFIERS: PISTON ACTUATOR, TIME DELAY
SQUIBS, DIMPLE MOTOR, CATERPILLAR, BELLONS
MOTOR, GUILLOTINE SWITCH, MONROE EFFECT. THE
DESIGN, OPERATION AND APPLICATION OF VARIOUS
PYROTECHNIC AND AUXILIARY ROCKET DEVICES, INCLUDING
CONSIDERATIONS OF SAFETY, FAILURE MODES AND CIRCUIT
DESIGN, ARE DISCUSSED. THE CONCLUSION IS REACHED
THAT THE USE OF SMALL PYROTECHNIC DEVICES AND
AUXILIARY ROCKET SYSTEMS MAKES POSSIBLE THE
PROGRAMMING OF NEARLY ALL DESIRED FUNCTIONS IN A
FREE-FLIGHT RESEARCH MODEL. FURTHER, THAT IN SPITE
OF THE DETAILED ANALYSIS AND PREFLIGHT TESTING
REQUIRED OF THESE DEVICES, THEIR DESIGN AND
OPERATIONAL SIMPLICITY PROVIDE A HIGHER DEGREE OF
SAFETY AND RELIABILITY THAN COMPARABLE MECHANICAL OR
ELECTROMECHANICAL PROGRAMMING SYSTEMS. IN
ADDITION, THE SMALL SIZE OF THESE DEVICES REDUCES
MODEL COSTS OR, ALTERNATIVELY, INCREASES THE AMOUNT
OF DATA THAT CAN BE OBTAINED FROM A FLIGHT MODEL OF A
GIVEN SIZE, SINCE MORE UNITS CAN BE INCORPORATED.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY - SEARCH CONTROL NO. /ZOM06

AD-288 745

NAVAL AMMUNITION DEPOT CRANE IND

CHEMICAL ANALYSIS OF RED SMOKE MIXTURE FOR VISIBILITY
INVESTIGATION OF SMOKES AND FLARES (U)

JUL 62 IV MCGRIFFIN, JAMES;
REPT. NO. RDTR 26

UNCLASSIFIED REPORT

DESCRIPTORS: •CHEMICAL ANALYSIS, •FLARES, •SMOKES,
•SPECTROGRAPHIC ANALYSIS, CHLORATES, POTASSIUM
COMPOUNDS, SODIUM COMPOUNDS, SUCROSE (U)

CHEMICAL ANALYSIS OF RED SMOKE MIXTURE FOR VISIBILITY
INVESTIGATION OF SMOKES AND FLARES.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-288 746

NAVAL AMMUNITION DEPOT CRANE IND

CHEMICAL ANALYSIS OF A TYPICAL 6-6-8 PYROTECHNIC
STARTER COMPOSITION

(U)

JUL 62 1V RIPLEY, WILLIAM:
REPT. NO. RDTR 27

UNCLASSIFIED REPORT

DESCRIPTORS: *COPPER COMPOUNDS, *LEAD COMPOUNDS,
*OXIDES, *PYROTECHNICS, *QUANTITATIVE ANALYSIS,
*SILICON, CHEMICAL ANALYSIS, ELECTRODEPOSITION (U)

CHEMICAL ANALYSIS OF A TYPICAL 6-6-8 PYROTECHNIC STARTER
COMPOSITION.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-288 958

HILLER RESEARCH CORP BALTIMORE MD

PRODUCTION COMPONENTS FOR CARTRIDGE, 81 MM
ILLUMINATING, T214E2

(U)

JUL 62 IV BRIGGEHAN, E. R. ;
REPT. NO. PR 251 6 62
CONTRACT: DA36 D340RD3468

UNCLASSIFIED REPORT

DESCRIPTORS: *ILLUMINATING PROJECTILES, CARTRIDGES,
PRODUCTION, PROJECTILES
IDENTIFIERS: T-214 CARTRIDGES, 81-MM

(U)

(U)

PRODUCTION COMPONENTS FOR CARTRIDGE, 81 MM ILLUMINATING,
T214E2.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-288 959

MILLER RESEARCH CORP BALTIMORE MD

PRODUCTION ENGINEERING OF PLASTIC COMPONENTS FOR
CARTRIDGE, 81 MM ILLUMINATING (U)

JUN 62 1V BRIGGEMAN, E.R.:

REPT. NO. PR 251 5 62

CONTRACT: DA36 0340RD3468

UNCLASSIFIED REPORT

DESCRIPTORS: •ILLUMINATING PROJECTILES, CARTRIDGES,
PRODUCTION, PROJECTILES (U)

IDENTIFIERS: T-214 CARTRIDGES, 81-MM (U)

PRODUCTION ENGINEERING OF PLASTIC COMPONENTS FOR
CARTRIDGE, 81 MM ILLUMINATING, T214E2.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-289 090

MILLER RESEARCH CORP BALTIMORE MD

PRODUCTION COMPONENTS FOR CARTRIDGE, 81MM
ILLUMINATING, T214E2

(U)

NOV 62 1V BRIGGEMAN, E. R. I
REPT. NO. PR 251 10 62
CONTRACT: DA36 0340RD3468

UNCLASSIFIED REPORT

DESCRIPTORS: *ILLUMINATING PROJECTILES, BALLISTICS,
DOCUMENTATION, TEST METHODS, TESTS
IDENTIFIERS: T-214 CARTRIDGES, 81-MM

(U)

(U)

EQUAD-289 090DIV. 22 U (TISTW/PCR) OTS PRICE
\$1.10 MILLER RESEARCH LAB., BALTIMORE,
MD. PRODUCTION COMPONENTS FOR CARTRIDGE, 81MM
ILLUMINATING, T214E2. MONTHLY PROGRESS REPT., 1-
31 OCT 62, BY E. R. BRIGGEMAN. 8 NOV 62, 5P.
(REPT. NO. PR-251-10-62) (CONTRACT DA 36-
034-ORD-3468) UNCLASSIFIED REPORT

DESCRIPTORS: *ILLUMINATING PROJECTILES,
TESTS, TEST METHODS, DPMENT DEVELOPMENT.

EQUAD-289 090DIV. 22 U (TISTW/PCR) OTS PRICE
\$1.10 MILLER RESEARCH LAB., BALTIMORE,
MD. PRODUCTION COMPONENTS FOR CARTRIDGE, 81MM
ILLUMINATING, T214E2. MONTHLY PROGRESS REPT., 1-
31 OCT 62, BY E. R. BRIGGEMAN. 8 NOV 62, 5P.
(REPT. NO. PR-251-10-62) (CONTRACT DA 36-
034-ORD-3468) UNCLASSIFIED REPORT

DESCRIPTORS: *ILLUMINATING PROJECTILES,
TESTS, TEST METHODS, DPMENT DEVELOPMENT.

EQUAD-289 090DIV. 22 U (TISTW/PCR) OTS PRICE
\$1.10 MILLER RESEARCH LAB., BALTIMORE,
MD. PRODUCTION COMPONENTS FOR CARTRIDGE, 81MM
ILLUMINATING, T214E2. MONTHLY PROGRESS REPT., 1-
31 OCT 62, BY E. R. BRIGGEMAN. 8 NOV 62, 5P.
(REPT. NO. PR-251-10-62) (CONTRACT DA 36-
034-ORD-3468) UNCLASSIFIED REPORT

DESCRIPTORS: *ILLUMINATING PROJECTILES,
TESTS, TEST METHODS, DPMENT DEVELOPMENT.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-289 445

NAVAL AMMUNITION DEPOT CRANE IND

SAFETY MANUAL. THE LABORATORY PREPARATION OF
PYROTECHNICS

(U)

JUL 62 1V ARMOUR, CARL;
REPT. NO. RDTR 29

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS), HAZARDS,
CHEMICALS, SENSITIVITY, COLORED SMOKES, FLARES,
DELAY ELEMENTS, IGNITERS, SAFETY

(H)

SAFETY MANUAL. THE LABORATORY PREPARATION OF
PYROTECHNICS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-297 999

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

RADIOMETRIC DETERMINATION OF HOMOGENEITY OF A
MULTICOMPONENT PYROTECHNIC MIXTURE

(U)

FEB 63

1V

GRAYBUSH, RICHARD J. CASTORINA, THOMAS

C. I.

REPT. NO. TR3057

UNCLASSIFIED REPORT

DESCRIPTORS: *PYROTECHNICS, BARIUM COMPOUNDS, MAGNESIUM,
MIXTURES, NITRATES, POWDER METALS, POWDERS, PROCESSING,
RADIOMETERS, SOLIDS

(U)

RADIOMETRIC DETERMINATION OF HOMOGENEITY OF A
MULTICOMPONENT PYROTECHNIC MIXTURE.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-299 293

NAVAL AMMUNITION DEPOT CRANE IND

FLARE PERFORMANCE INVESTIGATION

(U)

NOV 62 1V LOTTES, HENRY C. I
MONITOR: NAVWEPS 8250

UNCLASSIFIED REPORT

DESCRIPTORS: •FLARES, •ILLUMINATION, •MAGNESIUM,
•NITRATES, BINDERS, EXPERIMENTAL DATA, FLAMMABILITY,
MATHEMATICAL PREDICTION, PARTICLE SIZE, PROBABILITY,
SODIUM COMPOUNDS, STATISTICAL DISTRIBUTIONS, STRONTIUM
COMPOUNDS, TABLES (U)

FLARE PERFORMANCE INVESTIGATION.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-403 367

ROCKET POWER INC MESA ARIZ

PYROTECHNIC OUTSIDE WARNING SYSTEM.

(U)

DESCRIPTIVE NOTE: FINAL REPT. ON PHASE 1.

MAR 63 1V

REPT. NO. 7606A

CONTRACT: OCD 0562 76

UNCLASSIFIED REPORT

DESCRIPTORS: *WARNING SYSTEMS, *SMOKE PROJECTILES, *ROCKET FLARES, PASSIVE DEFENSE, NATIONAL DEFENSE, CONTROL SYSTEMS, MONITORS, CONTROL SEQUENCES, DESIGN, MULTIPLE OPERATION, LAUNCHING, PROPULSION, SPECIFICATIONS, TESTS, ROCKET LAUNCHERS, ROCKET MOTORS (SOLID PROPELLANT), ROCKET PROPULSION, ROCKET ASSISTED PROJECTILES, PYROTECHNICS.

(U)

IDENTIFIERS: POWS.

(U)

THE POWS WAS CONCEIVED AS A COMPLEMENT TO THE NATIONAL EMERGENCY ALARM REPEATER SYSTEM (NEARS), WHICH WILL PROVIDE INDOOR WARNING. THE POWS IS DESIGNED TO MEET THE NEED FOR A MASS, LOW-COST OUTDOOR ALERT SYSTEM WHICH CAN PROVIDE INSTANT AUDIBLE AND VISUAL WARNING, DAY OR NIGHT. THE POWS IS A COMPACT, LIGHTWEIGHT PACKAGE CONTAINING TWO WARNING ROCKETS AND A SPECIAL CONTROL UNIT. EACH ROCKET IS SEALED IN A METAL TUBE. THE CONTROL UNIT IS SEALED IN A SEPARATE ENCLOSURE BETWEEN THE TUBES. THESE POWS UNITS CAN BE MOUNTED ON ANY POLES OR BUILDINGS HAVING ACCESS TO ORDINARY 60-CYCLE POWER. THE CONTROL UNIT CONSTANTLY MONITORS THE POWER LINE TO DETECT THE PRESENCE OF A NEAR SIGNAL. UPON RECEIVING THIS SIGNAL, THE CONTROL UNIT WILL FIRE ONE ROCKET, SEQUENCE TO THE SECOND AND AWAIT ANOTHER SIGNAL. THE POWS COMPONENTS ARE HOUSED WITHIN THE ROCKET VEHICLE CASING, AND ARE EJECTED WHEN THE ROCKET VEHICLE REACHES ITS TERMINAL ALTITUDE. THE WARNING COMPONENTS ARE AN EXPLOSIVE CHARGE, A RED SMOKE CLOUD, AND AN INTENSE RED FLARE. THE FLARE AND ALL HARDWARE ARE LOWERED BY PARACHUTE. THE REQUIREMENTS FOR THE POWS ARE EXTREMELY RIGOROUS. THE UNITS MUST WITHSTAND TEMPERATURES RANGING FROM -65 DEGREES TO 200 DEGREES F. FOR A MINIMUM OF TEN YEARS AND REMAIN OPERABLE WITHOUT MAINTENANCE. (AUTHOR)

(U)

UNCLASSIFIED

/ZOM08

AD-404 312

PICATINNY ARSENAL DOVER N J

IMPROVED GREEN, RED, YELLOW AND VIOLET SMOKE
COMPOSITIONS FOR ROCKET-TYPE PARACHUTE GROUND
SIGNALS,

(U)

MAY 63 32P CRANE, EVERETT D.; IWERBEL,
BURTON ; WEINGARTEN, GARRY;
PROJ: 504 22 016
MONITOR: PA TM1033

UNCLASSIFIED REPORT

DESCRIPTORS: *SMOKE GENERATORS, *COLORED FLARES,
COLORED SMOKES, PARACHUTE FLARES, SMOKES,
MILITARY REQUIREMENTS, MARKERS, COLORS,
SIGNALS, FLARES, ROCKET FLARES, VISIBILITY,
ILLUMINATION.

(U)

A NUMBER OF STANDARD AND EXPERIMENTAL SMOKE COM
POSITIONS IN FOUR COLORS - GREEN, RED, YELLOW, AND
VIOLET - WERE EVALUATED FOR USE IN THE NEW HAND-HELD
GROUND SIGNAL. THE STANDARD XM129 RED SMOKE
PARACHUTE FLARE COMPOSITION AND THE STANDARD XM128
GREEN SMOKE PARACHUTE FLARE COM POSITION FAILED TO
GIVE GOOD VISIBLE COLORS OR ACCEPTABLE BURNING
TIMES. IN GENERAL, WHEN THE POTASSIUM CHLORATE/
SUGAR RATIO IS LESS THAN THE 3 TO 1 STOICHIOMETRIC
PROPORTION, ANY INCREASE OF POTASSIUM CHLORATE AND
DECREASE OF SUGAR MAKES FOR FASTER BURNING. MOST
SULFUR-CONTAINING COM POSITIONS INVESTIGATED BURNED
TOO HOT FOR THIS APPLICATION. BALLISTIC BURNING
TIMES WERE SLOWER THAN STATIC BURNING TIMES FOR THE
YELLOW, RED AND VIOLET SMOKES BUT FOR THE GREEN
SMOKES THERE WAS NO DIFFERENCE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-404 853

AIR PROVING GROUND CENTER EGLIN AFB FLA

ENGINEERING INVESTIGATION OF IGNITION FAILURE RATE
OF TAU-15/B INFRARED TARGET FLARES, (U)

MAY 63 52P BUNN, RUSSELL A. I

REPT. NO. APGC-TDR-63-27

PROJ: 7826W28

UNCLASSIFIED REPORT

DESCRIPTORS: *ROCKET FLARES, TEST METHODS,
FLIGHT TESTING, IGNITERS, HIGH ALTITUDE, TAR
GETS, FLARES, INFRARED RADIATION, EFFECTIVE
NESS, MALFUNCTIONS, RELIABILITY. (U)

UNSATISFACTORY OPERATION OF THE TAU-15/B
INFRARED TARGET FLARES HAD BEEN OBSERVED WHEN THESE
FLARES WERE EMPLOYED AT HIGH SUBSONIC SPEEDS AND HIGH
(35,000 FT) ALTITUDE. THE PRIMARY DIFFICULTY
WAS FAILURE OF A SIGNIFICANT PERCENTAGE OF THE FLARES
TO BURN AFTER SUCCESSFUL OPERATION OF THE IGNITION
SQUIBS. SINCE IT WAS BELIEVED THAT AGE OF THE
FLARES MAY HAVE AFFECTED THEIR OPERATIONAL
PERFORMANCE, THIS TEST WAS CONDUCTED TO INVESTIGATE
THE IGNITION FAILURE RATE OF TAU-15/B FLARES
WHICH HAD BEEN IN STORAGE SINCE THE JULY OCTOBER
1960 MANUFACTURING PERIOD. SPECIFIC OBJECTIVES OF
THE TEST WERE TO DETERMINE THE IGNITION FAILURE RATE
DURING FLIGHT AT 35,000 FT ALTITUDE AND MACH 0.7 AS
WELL AS UNDER SIMULATED FLIGHT CONDITIONS IN AN
ALTITUDE CHAMBER. IT WAS CONCLUDED THAT
PERFORMANCE OF THE TAU-15/B FLARES VARIES FROM
ONE PRODUCTION LOT TO ANOTHER AND WITH ALTITUDE AND
THE INTERNAL TEMPERATURE OF THE INDIVIDUAL FLARES.
RESULTS OBTAINED UNDER SIMULATED ALTITUDE
CONDITIONS IN THE ALTITUDE CHAMBER CORRELATED
REASONABLY WELL WITH THOSE OBTAINED DURING AIRBORNE
TESTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-409 969

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

DEVELOPMENT OF XM144 HAND-HELD GROUND SIGNAL
SERIES,

(U)

JUN 63 71P LOPATIN, SEYMOUR ;
MONITOR: TM1193

UNCLASSIFIED REPORT

DESCRIPTORS: (*SIGNALS, ROCKETS), (*PYRO
TECHNICS, SIGNALS), SPIN-STABILIZED AMMUNITION,
DISTRESS SIGNALS, PARACHUTE FLARES, ROCKET
FLARES, ARMS, SMOKE MUNITIONS, SMOKES,
OPERATION.

(U)

IDENTIFIERS: 1963.

(U)

THE REPORT CONTAINS A SUMMARY OF MAJOR EVENTS IN
THE DEVELOPMENT OF THE XM SERIES HAND-HELD
SIGNALS FROM TIME OF PROGRAM INITIATION TO THE
PRESENT, PERTINENT MATERIEL, PHYSICAL, OPERATIONAL,
AND PERFORMANCE CHARACTERISTICS, COMPARISONS OF
SEVERAL TYPES OF SIGNALS AND OTHER SIGNIFICANT
INFORMATION, DATA, AND DOCUMENTS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM03

AD-411 548

NAVAL AMMUNITION DEPOT CRANE IND

INVESTIGATION OF MK 25 MOD 2 SMOKE-FLARE
COMPOSITION, (U)

MAY 63 IV RIPLEY, WILLIAM J
REPT. NO. NAD-CR-RDTR-33

UNCLASSIFIED REPORT

DESCRIPTORS: (•SMOKE BOMBS, GRAVIMETRIC
ANALYSIS), (•FLARES, GRAVIMETRIC ANALYSIS),
(•CHEMICAL ANALYSIS, THERMODYNAMICS), THEORY,
STABILITY, SENSITIVITY, IGNITION, HEAT OF
REACTION, CHEMICAL REACTIONS, PHOSPHORUS,
MAGNESIUM, MANGANESE COMPOUNDS, DIOXIDES,
MIXTURES. (U)

IDENTIFIERS: 1963, MK 25. (U)

A STUDY IS MADE ON VARIOUS CHEMICAL AND PHYSICAL
CHARACTERISTICS OF THE MK 25 SMOKE-FLARE
COMPOSITION, WHICH IS BASICALLY A RED PHOSPHORUS-
MAGNESIUM-MANGANESE DIOXIDE SYSTEM. A SCHEME FOR
CHEMICAL ANALYSIS IS REVIEWED. PHYSICAL PHASE
CHANGES AND CHEMICAL REACTION MECHANISMS OF THE
COMPONENTS AND OF THE MIXTURE AS A WHOLE ARE EX-
PLORED BY DIFFERENTIAL THERMAL ANALYSIS AND THER-
MOGRAVIMETRIC ANALYSIS. FACTORS AFFECTING THE
IGNITION POINT ARE CONSIDERED. AFTER SOME INVE-
STIGATION, AN ATTEMPT IS MADE TO WRITE THE PRINCIPAL
INTERNAL AND EXTERNAL REACTIONS FOR THIS COMPLEX AND
NON-STOICHIOMETRIC SYSTEM. BEHAVIOR
CHARACTERISTICS, SUCH AS SENSITIVITY, STABILITY, HEAT
OF REACTION, IGNITION POINT, ETC., ARE DETERMINED AND
REPORTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-412 940

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

A. PYRO-MECHANISM,

(U)

JUL 63 8P ROKHLIN, G. A. IZASKO, V. M. I
MONITOR: FTD TT61 366

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM RUSSIAN PATENT NO.
129950 (APPL. NO. 639728), PP. 1-2, 26 SEP 59.

DESCRIPTORS: (•EJECTION SEATS, ACTUATORS),
(•ACTUATORS, PYROTECHNICS), SAFETY DEVICES,
SPIN RECOVERY PARACHUTES, PATENTS,
STABILIZATION.

(U)

IDENTIFIERS: 1959, USSR.

(U)

THIS INVENTION IS A PYRO-MECHANISM WHICH HAS TWO
PYRO-HEADS. THE UPPER HEAD, CONNECTED TO A ROD BY
MEANS OF A BALL LOCK AND AN EXTENSION STRAND,
CONTAINS A SMALL STABILIZING PARACHUTE; THE LOWER
PYRO-HEAD HAS A BOLT WHICH LOCKS THE PYRO-MECHANISM
TO THE SEAT, FIRING IT FROM THE SEAT AND ACTIVATING
THE SECOND STABILIZING CHUTE. (AUTH-D

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-416 033

RESIN RESEARCH LABS INC NEWARK N J

INVESTIGATION OF NEW TYPE POLYMERS TO BE USED IN
PYROTECHNIC FUELS FOR THERMAL DISSEMINATION OF
AGENTS.

(U)

DESCRIPTIVE NOTE: BI-MONTHLY PROGRESS REPT.

AUG 63 27P

REPT. NO. 984

CONTRACT: DA18 108AMC26D

UNCLASSIFIED REPORT

DESCRIPTORS: (*POLYMERS, PYROTECHNICS), (*PY
ROTECHNICS, FUELS), (*CARBOHYDRATES, PYROLYSIS),
(*ORGANIC COMPOUNDS, PYROTECHNICS), CHEMICAL
REACTIONS, SUCROSE, GLUCOSE, LACTOSE, FUELS,
DEHYDRATION, ORGANIC NITROGEN COMPOUNDS, CON
DENSATION REACTIONS, CHEMICAL WARFARE AGENTS,
DIFFUSION, FEASIBILITY STUDIES, ALCOHOLS,
GLYCOSIDES.

(U)

IDENTIFIERS: 1963, FORMALDEHYDE, POLYOLS, DIPRO
PYLENE GLYCOL, DIETHYLENE GLYCOL.

(U)

DURING THE FIRST TWO MONTHS OF INVESTIGATION INTO
THE PRODUCTION OF ANHYDROUS SYRUPS FROM SIMPLE
SUGARS, THE FOLLOWING REACTIONS WERE STUDIED: (1)
SUGAR PYROLYSIS; (2) SUGAR-FORMALDEHYDE RE
ACTIONS; (3) SUGAR CONDENSATIONS WITH NITRO COM
POUNDS; AND (4) SUGAR REACTIONS WITH POLYOLS.
MOST PROMISING RESULTS HAVE BEEN OBTAINED WITH
DIPROPYLENE AND DIETHYLENE GLYCOL REACTION PROD UCTS
WITH GLUCOSE. THE PYROLYSIS EXPERIMENTS HAVE ALL
LED TO THE FORMATION OF GLASSY SOLIDS.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-420 028

NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF

C12 DETONATOR MALFUNCTIONS IN EX 1 MOD 0 ILLUMINATING
HAND GRENADE. (U)

DESCRIPTIVE NOTE: TECHNICAL PROGRESS REPT.,

SEP 63 11P ALLEN, EDWARD A. I
MONITOR: NOTS IDP1901

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ILLUMINATING GRENADES, MALFUNCTIONS),
DETONATORS, PRIMERS, GRENADES (U)

IDENTIFIERS: 1963, C-12 DETONATORS, M-25 GRENADES,
MARK-39 PRIMERS (U)

THE C12 DETONATOR, LOT OM-1-23, CAUSED
MALFUNCTION OF THE M25A2 GRENADE IN THREE WIDELY
SEPERATED INSTANCES. AT CHERRY POINT, NORTH
CAROLINA, AND AT TWENTYNINE PALMS,
CALIFORNIA, FAILURES OCCURED WITH THE CS1 LOAD.
AT CHINA LAKE, CALIFORNIA, FAILURES OCCURRED
WITH SIX-MONTH SURVEILLANCE SAMPLES LOADED WITH
TIARA, FORMULA 5. NO LEAKAGE OF THE TIARA 5
LOAD INTO THE DETONATOR CAVITY WAS DETECTED IN ANY
SURVEILLANCE SAMPLES. PINE BLUFF ARSENAL,
PINE BLUFF, ARKANSAS, ADVISED THAT MALFUNCTION
WAS CAUSED BY DEFECTIVE MK 39 A1 PRIMERS, AND
THAT THESE ARE BEING REPLACED BY THE EX 2926A
WESTERN CARTRIDGE DESIGN PRIMERS IN A NEW
PROCUREMENT. ACCELERATED SURVEILLANCE OF THE EX 1
MOD 0 ILLUMINATING GRENADE WILL BE STARTED
ON RECEIPT OF THE NEW PRIMER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-420 238

PICATINNY ARSENAL DOVER N J

AN INVESTIGATION INTO THE FEASIBILITY OF A
PYROTECHNIC LASER PUMP,

(U)

AUG 63 61P SMITH, CHESTER L. IKISATSKY,
PAUL J. I
MONITOR: PA TR3102

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*LASERS, PUMPING (ELECTRONICS)), (*PUMPING
(ELECTRONICS), PYROTECHNICS), (*PYROTECHNICS, PUMPING
(ELECTRONICS)), EMISSIVITY, EXPLOSIVE MATERIALS,
ZIRCONIUM, POTASSIUM COMPOUNDS, PERCHLORATES, HIGH
TEMPERATURE RESEARCH, THORIUM, BRIGHTNESS, INTENSITY,
PETN, BARIUM COMPOUNDS, NITRATES, XENON LAMPS (U)
IDENTIFIERS: OPTICAL PUMPING, 1963 (U)

PYROTECHNIC COMPOSITIONS CONSISTING OF TWO BASIC
INGREDIENTS - FUELS AND OXIDIZERS - WERE TESTED IN
VARIOUS COMBINATIONS. COMBINATIONS OF PYROTECHNIC
INGREDIENTS AND HIGH EXPLOSIVES WERE ALSO EXAMINED
AND HIGH EXPLOSIVES IN VARIOUS CONFIGURATIONS WERE
TESTED. BRIGHTNESS TESTS WERE ALSO CONDUCTED WITH
VARIOUS MEANS OF CONTAINING AND CONFINING MATERIALS.
ZR/KClO₄ EMERGED AS THE BRIGHTEST EMITTER, AND
THE BRIGHTNESS WAS ENHANCED BY THE USE OF A FIXTURE.
THE INGREDIENTS WERE VARIED FROM STOICHIOMETRIC TO
FUEL RICH COMBINATIONS, WITH THE STOICHIOMETRIC RATIO
GIVING THE CONSTANTLY HIGHEST OUTPUT ON THE
BRIGHTNESS BENCH. THE TEMPERATURE ARRIVED AT WITH
THIS COMBINATION WAS ABOUT 4900 KELVIN. SOME
THEORETICAL WORK WAS DONE THAT SHOWS EVEN HIGHER
TEMPERATURES CAN BE PRODUCED WITH A FUEL SUCH AS
THORIUM. THORIUM OXIDE WHICH WOULD BE PRODUCED,
HAS AN EVEN HIGHER STABILITY THAN THE OXIDES TESTED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOMOB

AD-422 745

ATLANTIC RESEARCH CORP ALEXANDRIA VA

SURVEY OF RECENT INVESTIGATIONS OF PLASTICBONDED AND
CASTABLE SMOKE COMPOSITIONS. (U)

DESCRIPTIVE NOTE: SPECIAL REPT. 1-31 MAR 63,
APR 63 54P SALVADOR, L.A. ISCHEFFEE, R.
S. I
CONTRACT: DA18 108AMC40

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SMOKE MUNITIONS, MATERIALS), (*COLORED
SMOKES, MATERIALS), (*BINDERS, SMOKE MUNITIONS),
PYROTECHNICS, CASTINGS, VINYL PLASTICS, POLYESTER
PLASTICS, DYES, MANUFACTURING METHODS, ARMY RESEARCH,
BIBLIOGRAPHY (U)
IDENTIFIERS: 1963, LAMINAC 4116 (U)

A6SURVEY OF RECENT WORK IN THE DEVELOPMENT OF
CASTABLE AND PLASTIC-BONDED PYROTECHNICS WAS MADE.
THE SURVEY INCLUDED THE SEARCH OF AVAILABLE
LITERATURE AND PRIVATE COMMUNICATIONS WITH PERSONNEL
CONCERNED WITH THESE DEVELOPMENT. TWO PLASTIC
BINDER SYSTEMS WERE DEVELOPED TO THE EXTENT THAT THEY
ARE PRACTICAL. ONE FORMULATION IS BASED ON
POLYVINYL ACETATE WITH A SOLVENT EXTENDER AND ONE IS
BASED ON LAMINAC 4116 POLYESTER RESIN WITH STYRENE
ADDED TO INCREASE FLUIDITY. RESULTS OF TEST, AS
WELL AS OTHER WORK TO DATE, INDICATE THAT
PLASTICBONDED GRENADES SHOW PROMISE AND SHOULD BE
DEVELOPED MORE FULLY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-426 005

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

EVALUATION OF DOPED PERCHLORATES IN EXPERIMENTAL
PHOTOFLASH COMPOSITIONS, (U)

OCT 63 20P EDELMAN, DAVID J. IKAYE,
SEYMOUR M. ;
REPT. NO. PA-TM-1091
PROJ: DA-5504-01-027

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, IMPURITIES), (*POTASSIUM
COMPOUNDS, PYROTECHNICS), (*PERCHLORATES, PYROTECHNICS),
(*IMPURITIES, PYROTECHNICS), LUMINESCENCE, PHOTOFLASH
CARTRIDGES, SILVER, COPPER, IODINE, IONS, SIMULATION,
HIGH ALTITUDE, ALUMINUM, CALCIUM, CALCIUM COMPOUNDS,
FLUORIDES (U)

IDENTIFIERS: 1963, FP600, FP790, FP856, POTASSIUM
PERCHLORATE, CALCIUM FLUORIDE (U)

EFFECTS OF AN OXIDANT CONTAINING ADDED IMPURITIES
SUCH AS AG(+), CU(++), AND I(-) IONS UPON
THE LUMINOSITY OF FLASH SYSTEMS WERE TESTED IN THE
FOLLOWING BLENDS: (1) FP600 (60/40
KClO4/AL PHOTOFLASH COMPOSITION FOR SEA LEVEL
APPLICATION (2) FP790 (30/20/50) CA/AL/
KClO4) PHOTOFLASH COMPOSITION FOR HIGH ALTITUDE
APPLICATIONS (3) FP856 (31/20/49 AL/CAF/
KClO4) HIGH ALTITUDE FLASH COMPOSITION. ALL
TESTS WERE PERFORMED AT SEA LEVEL OR AT 20.9 MM HG,
SIMULATING 80,000 FEET ALTITUDE, AND AT THE
TEMPERATURE PREVAILING AT THE PYROTECHNIC
LABORATORY HIGH ALTITUDE TANK. THE SYSTEM
40/60 AL/KClO4 DOPED WITH AG(+), CU(++),
OR I(-) IONS EXHIBITED NO INCREASE IN LUMINOUS
EFFICIENCY OVER A NON-DOPED CONTROL AT AMBIENT
CONDITIONS. AT 80,000 FEET, INCREASED EFFICIENCIES
WERE ACHIEVED WITH DOPED SYSTEMS, BUT THE RESULTS
COULD NOT BE VERIFIED IN A SECOND SERIES OF TESTS.
WITHIN THE SYSTEMS 30/20/50 CA/AL/KClO4 AND
31/20/49 AL/CAF/ KClO4, THE COMPOSITIONS
CONTAINING KClO4 DOPED WITH AG(+) IONS SHOWED
THE GREATEST INCREASES IN LUMINOUS EFFICIENCIES,
RANGING UP TO 27.08 AND 29.48 RESPECTIVELY AT
80,000 FT. HOWEVER, NEITHER SYSTEM GAVE VERIFIABLE
RESULTS ON RETEST. THE ABOVE SYSTEMS DOPED WITH
CU(++) AND I(-) IONS GAVE RESULTS THAT WERE
EITHER NOT VERIFIABLE OR ELSE EXHIBITED LOWER
EFFICIENCY VALUES. (AUTHOR)

(U)

47
UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-427 565

DUGWAY PROVING GROUND UTAH

SURVEILLANCE TEST (ENVIRONMENTAL) OF GRENADE, HAND
RIOT, CS, ABC-M7A2; DPGR 387.

(U)

JAN 64 38P
REPT. NO. DPG-R-387

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•GRENADES, NON-LETHAL AGENTS), (•NON-
LETHAL AGENTS, GRENADES), STORAGE, HANDLING,
PYROTECHNICS, DESERT TESTS, COLD WEATHER TESTS,
DEGRADATION, ENVIRONMENTAL TESTS

(U)

IDENTIFIERS: 1964, M-7 GRENADES, RIOT CONTROL

(U)

TESTS WERE CONDUCTED TO DETERMINE THE EFFECTS OF
ENVIRONMENT UPON THE STORAGE AND FUNCTIONING OF THE
GRENADE, HAND, RIOT, CS, ABC-M7A2, IN CLIMATES
REPRESENTED BY THE ARCTIC, DESERT, TEMPERATE, AND
TROPIC TEST SITES. THE GRENADE IS A 28-GAUGE STEEL
CYLINDER 2.5 INCHES IN DIAMETER AND 4.5 INCHES LONG.
IT IS IGNITED BY A STANDARD M201A1 FUZE
THREADED INTO THE GRENADE TOP. IT IS FILLED WITH
APPROXIMATELY 275 GRAMS OF CS AGENT - PYROTECHNIC
MIX IN THE FORM OF A PRESSED SOLID WITH A SLIGHTLY
TAPERED HOLE THROUGH THE CENTER. THE TOP OF THE
FILLING AND THE HOLE THROUGH IT ARE COATED WITH A
STARTER MIXTURE. THE AGENT AEROSOL CLOUD IS
EMITTED THROUGH A 1/2-INCH HOLE IN THE CENTER OF THE
BOTTOM OF THE GRENADE AND THROUGH THREE 3/16-INCH
HOLES IN THE TOP OF THE GRENADE. THE AGENT
DISSEMINATION HOLES ARE COVERED WITH PRESSURE-
SENSITIVE TAPE TO PROTECT THE FILLING FROM MOISTURE.
THESE TAPES ARE BLOWN OFF WHEN THE GRENADE IS
IGNITED. THE GRENADE WILL, IN GENERAL, FUNCTION
SATISFACTORILY AFTER STORAGE FOR PERIODS RANGING FROM
23 TO 29 MONTHS AT THE ARCTIC, DESERT, TEMPERATE, AND
TROPIC TEST SITES. THE TENDENCY OF VIOLENT
REACTION AFTER PERIODS OF APPROXIMATELY 12 MONTHS,
DEPENDING UPON THE SITE, IS CONSIDERED
UNSATISFACTORY. THIS TENDENCY, HOWEVER, IS NOT OF
SUCH A NATURE AS TO RENDER THE GRENADE WHOLLY
UNSATISFACTORY.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-432 099

PHILCO CORP PHILADELPHIA PA

LASER PUMPING SOURCES.

(U)

DESCRIPTIVE NOTE: SEMIANNUAL TECHNICAL REPT.,
JAN 64 47P BYRON, S. ; SHANFIELD, H. ;
LAWRENCE, W. ; KILLIAN, J. ;
REPT. NO. U2520
CONTRACT: NONR 423700
PROJ: 3730

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*LASERS, INTENSITY), (*PYROTECHNICS,
MATERIALS), GASES, SHOCK WAVES, EXPLOSIONS, SHOCK TUBES,
RUBY, ZIRCONIUM, OXYGEN, FLASH LAMPS (U)
IDENTIFIERS: OPTICAL BOMBS, L964 (U)

THE PRINCIPLES OF THE CONVERSION F EXPLOSIVE
ENERGY TO SHOCK HEATED GAS ENERGY SUITABLE AS A
RADIATION SOURCE ARE REVIEWED. FROM THIS IT IS
CONCLUDED THAT THERE ARE TWO MAJOR LIMITING FACTORS
ASSOCIATED WITH ADAPTING EXPLOSIVE LIGHT SOURCES
DEVELOPED PREVIOUSLY TO LASER PUMPING. THE FIRST
IS THE DESTRUCTIVE NATURE OF THESE SOURCES, RESULTING
IN LOSS OF COSTLY LASER CRYSTALS. THE SECOND IS
THE USE F RADIATION FROM GAS HEATED ONLY BY THE
INCIDENT SHOCK WAVE RATHER THAN BY THE REFLECTED
SHOCK AS WELL. A CONSIDERABLE GAIN IN ENERGY
CONVERSION EFFICIENCY AND CONVENIENCE WILL BE
REALIZED BY DEVELOPING A NONDESTRUCTIVE, EXPLOSIVELY
DRIVEN, RADIATION SOURCE WHICH MAKES USE OF REFLECTED
SHOCK HEATED GAS. AN EXPERIMENTAL AND THEORETICAL
EVALUATION OF SUCH A SOURCE IS BEING CARRIED OUT,
USING 4.5 GRAMS OF HIGH EXPLOSIVE DRIVING A SHOCK
THROUGH XENON AT SUB-ATMOSPHERIC INITIAL PRESSURES IN
A ONE INCH DIAMETER, THREE FOOT LONG TUBE. SHOCK
SPEED MEASUREMENTS SHOW THAT ABOUT 20% OF THE
EXPLOSIVE ENERGY IS GIVEN TO THE SHOCK HEATED GAS.
SPECTRAL MEASUREMENTS SHOW THAT THE RADIATION IS
PREDOMINANTLY CONTINUUM AND THAT THE REFLECTED SHOCK
HEATED GAS IS OPTICALLY THICK, IN AGREEMENT WITH
THEORETICAL PREDICTIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-433 964

HAYES INTERNATIONAL CORP BIRMINGHAM ALA

DESIGN STUDY FOR INFRARED MEASUREMENT OF PYROTECHNIC
FLARES. (U)

MAR 64 44P

CONTRACT: AF08 635 3789

PROJ: 7849

MONITOR: ATL TDR64 10

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FLARES, RADIOMETERS), (*RADIOMETERS,
FLARES), INFRARED RADIATION, MEASUREMENT, INTENSITY,
ELECTRONIC EQUIPMENT, SENSITIVITY, SIGNAL-TO-NOISE
RATIO, RESOLUTION, CALIBRATION, TEST EQUIPMENT, DESIGN
IDENTIFIERS: 1963 (U)

THE RESULTS OF THIS CONTRACT PROVIDE DESIGN
CRITERIA FOR RADIOMETRIC EQUIPMENT TO ESTABLISH A
STANDARD TECHNIQUE TO OBTAIN REPRODUCIBLE INFRARED
MEASUREMENTS OF PYROTECHNIC FLARES WHEN PERFORMED BY
UNTRAINED PERSONNEL IN A WIDE VARIETY OF AMBIENT
CONDITIONS. THE METHOD USED TO SPECIFY THE DESIGN
CRITERIA HAS BEEN TO COMPLETE THE ACTUAL DESIGN OF AN
INFRARED MEASUREMENT SYSTEM WHOSE CHARACTERISTICS
HAVE BEEN SELECTED AS BEING OPTIMUM FOR FLARE
MEASUREMENTS. VARIOUS GENERAL TECHNIQUES AND TYPES
OF INSTRUMENTATION ARE COMMENTED UPON, BUT NO
RECOMMENDATIONS FOR THE USE OF SPECIFIC COMMERCIAL
EQUIPMENT HAVE BEEN MADE WITH RESPECT TO FLARE
MEASUREMENTS. THIS APPROACH WILL PERMIT EVALUATION
OF ANY PARTICULAR INFRARED DEVICE FOR POSSIBLE USE
IN FLARE MEASUREMENT, BY COMPARISON OF ITS PARAMETERS
WITH THOSE OF A SYSTEM SPECIFICALLY DESIGNED FOR
ACCURATE REPEATABLE FLARE MEASUREMENTS. A SEPARATE
SYSTEM FOR USE IN QUALITY CONTROL DURING FLARE
MANUFACTURE IS RECOMMENDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-434 664

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

EVALUATION OF NONGASEOUS HIGH ALTITUDE FLARE
COMPOSITIONS, (U)

FEB 64 22P

KRISTAL, JOSEPH IKAYE, SEYMOUR

M. ;

REPT. NO. PA-TM-1270

PROJ: DA-504-01-027

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLARES, PYROTECHNICS), (*PYROTECHNICS,
FLOWS), SIMULATION, HIGH ALTITUDE, LUMINESCENCE, BURNING
RATE, ZIRCONIUM, CALCIUM COMPOUNDS, BORIDES, MAGNESIUM,
OXIDES, MANGANESE COMPOUNDS, MOLYBDENUM COMPOUNDS,
CHROMIUM COMPOUNDS, BARIUM COMPOUNDS, STRONTIUM
COMPOUNDS, IRON COMPOUNDS, PEROXIDES, CHROMATES,
THERMOCHEMISTRY (U)
IDENTIFIERS: 1964, CALCIUM BORIDE, MANGANESE DIOXIDE,
MOLYBDENUM TRIOXIDE, CHROMIUM (III) OXIDE, TUNGSTEN
(VI) OXIDE, BISMUTH TRIOXIDE, BARIUM CHROMATE, BARIUM
PEROXIDE, STRONTIUM PEROXIDE, IRON (III) OXIDE (U)

A SURVEY WAS CONDUCTED OF ESSENTIALLY NONGASEOUS
FLARE SYSTEMS AT SEA LEVEL AND REDUCED PRESSURE
CONDITIONS EQUIVALENT TO ALTITUDES RANGING UP TO 100,
000 FEET. THE LUMINOSITY OF NONGASEOUS SYSTEMS WAS
FOUND TO UNDERGO LESS REDUCTION AND THEIR PRESSURE
COEFFICIENT OF BURNING RATE SHOWED LESS CHANGE ON
TRANSITION FROM SEA LEVEL TO REDUCED PRESSURE
CONDITIONS THAN THOSE DEVELOPED BY GASEOUS FLARE
SYSTEMS. IT WAS FOUND THAT NONGASEOUS SYSTEMS,
WHEN TESTED AT REDUCED PRESSURE, GAVE CANDLEPOWER AND
BURNING TIME VALUES THAT APPROXIMATE OR EXCEED THOSE
OF STANDARD MAGNESIUM-SODIUM NITRATE COMPOSITIONS
UNDER THE SAME REDUCED PRESSURE CONDITIONS. NO
NONGASEOUS SYSTEM STUDIED PRODUCED GREATER
CANDLEPOWER OR LUMINOUS EFFICIENCY AT REDUCED
PRESSURES THAN THE METALLIC CALCIUM GASEOUS SYSTEMS
FOUND OPTIMUM FOR LOW PRESSURE USE. THE MATERIALS
INVESTIGATED WERE ZR, CaB₆, B, AND MG AS
FUELS AND MnO₂ 8:20₃, MOO₃, CR₂O₃, WO₃,
BI₂O₃, BaCrO₄, BaO₂, SrO₂, Fe₂O₃ AS
OXIDANTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-436 880

BUREAU OF NAVAL WEAPONS HYDROBALLISTICS ADVISORY COMMITTEE
WASHINGTON DC

TOXIC HAZARDS ASSOCIATED WITH PYROTECHNIC ITEMS, (U)

NOV 63 95P
MONITOR: NAVWEPS OP2793

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES 19 MAY 59 EDITION.

DESCRIPTORS: (*PYROTECHNICS, HAZARDS), TOXICITY, WOUNDS
+ INJURIES, HUMANS, BODY, SKIN, EYE, MEMBRANES
(BIOLOGY), RESPIRATORY SYSTEM, GASTROINTESTINAL SYSTEM,
BLOOD, ABSORPTION (BIOLOGICAL), COLORED SMOKES,
PARACHUTE FLARES, AIRCRAFT FLARES, DISTRESS SIGNALS,
SMOKES, SMOKE BOMBS, SMOKE MUNITIONS (U)

THIS PUBLICATION PRESENTS A COMPILATION OF THE
TOXICITY CHARACTERISTICS OF ALL PYROTECHNIC
COMPOSITIONS IN FLEET USE. ALSO PRESENTED ARE
THOSE COMPOSITIONS UNDER DEVELOPMENT BY THE
DEPARTMENT OF DEFENSE FOR NAVAL USE. THE
PUBLICATION PROVIDES DATA CONCERNING THE DEGREE OF
INJURY IMPOSED WHEN NAVAL PERSONNEL ARE EXPOSED TO
TOXIC CHEMICAL INGREDIENTS, HAZARDOUS RESIDUES, AND
RESULTANT PRODUCTS FROM BURNING PYROTECHNIC
COMPOSITIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-437 978

NAVAL AMMUNITION DEPOT CRANE IND

INVESTIGATION OF THE BURNING CHARACTERISTICS OF THE
LEAD DIOXIDE-CUPRIC OXIDE-SILICON STARTER
COMPOSITION. (U)

DESCRIPTIVE NOTE: REPT. FOR APR 63-FEB 64,
MAR 64 71P RIPLEY, WILLIAM I
MONITOR: IDEP 415.00.00.00-X9-03

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PYROTECHNICS, MARKERS), (*OXIDES,
MARKERS), (*MARKERS, MATERIALS), COPPER COMPOUNDS,
SILICON, LEAD COMPOUNDS, DIOXIDES, HEAT OF REACTION,
PRESSURE, TIME, OXIDIZERS, PARTICLE SIZE, HEAT TRANSFER,
IGNITION, TABLES, CALORIMETERS, BURNING RATE,
COMBUSTION (U)

IDENTIFIERS: FACTORIAL DESIGN, COPPER (II) OXIDE, LEAD
DIOXIDE, CALORIMETRY, MARK 25 STARTER COMPOSITION,
MARINE MARKERS (U)

A STUDY IS MADE OF THE BURNING CHARACTERISTICS OF A
STATISTICAL FAMILY OF 16 FUEL-RICH COMBINATIONS OF
THE LEAD DIOXIDE-CUPRIC OXIDE-SILICON STARTER MIX
SYSTEM. FACTORS THAT DETERMINE THE BEHAVIOR AND
PREDICTABILITY OF THE SYSTEM ARE DEFINED AND
INVESTIGATED BY CALORIMETRY, PRESSURE-TIME CURVE
STUDIES AND OTHER TECHNIQUES. THE BURNING
CHARACTERISTICS REQUIRED FOR OPTIMUM PERFORMANCE AS A
STARTER COMPOSITION ARE CONSIDERED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-438 782

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

IMPROVISED PYROTECHNIC MIXTURES FOR GUERRILLA WARFARE
APPLICATIONS, (U)

APR 64 19P JACKSON, BOSSIE, JR. IKAYE,
SEYMOUR M. ;
PROJ: 1A542703D346
MONITOR: PA TM1280

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*GUERRILLA WARFARE, PYROTECHNICS),
(*PYROTECHNICS, GUERRILLA WARFARE), (*INCENDIARY
MIXTURES, GUERRILLA WARFARE), IGNITION, DEMOLITIONS,
TEST VEHICLES, ALUMINUM, SODIUM COMPOUNDS, POTASSIUM
COMPOUNDS, PERCHLORATES, NITRATES, SULFUR, AMMONIUM
COMPOUNDS, CHLORIDES, IRON COMPOUNDS, SULFIDES, OXIDES,
MAGNESIUM, IRON, POWDER METALS, CHARCOAL, COAL, WOOD,
OILS (U)
IDENTIFIERS: POTASSIUM PERCHLORATE, POTASSIUM
NITRATE, SODIUM NITRATE, AMMONIUM CHLORIDE, IRON (II)
OXIDE, IRON (II) SULFIDE, AMMONIUM NITRATE (U)

A SERIES OF PYROTECHNIC FORMULATIONS DEVELOPED
FROM READILY AVAILABLE CONSTITUENTS FOR USE IN
GUERRILLA WARFARE WERE EVALUATED. THE SYSTEMS
WERE TESTED UNDER CONFINEMENT PROVIDED BY TWO TEST
VEHICLES CONSISTING OF SHORT SECTIONS OF CAST IRON
PIPE, ONE HAVING A 2-IN. INSIDE DIAMETER AND THE
OTHER A 1-IN. INSIDE DIAMETER. BOTH WERE THREADED
AND SEALED AT BOTH ENDS WITH CAPS, WITH EITHER
LAMINAC 4116 RESIN OR DUCO CEMENT AS THE SEALING
COMPOUND. INITIATION WAS ACCOMPLISHED BY PLACING
EITHER COMMERCIAL QUICKMATCH OR A J-2 BLASTING CAP
THROUGH A PERFORATION IN THE TOP CAP. PERFORMANCE
WAS GRADED IN ACCORDANCE WITH THE SYSTEM'S CAPABILITY
OF REACTING COMPLETELY AND THE DEGREE OF
FRAGMENTATION OF THE TEST VEHICLE. A NUMBER OF
SYSTEMS, SUCH AS 90/100 POTASSIUM CHLORATE/
PETROLATM, 71/29 POTASSIUM NITRATE/GRAINS OF WOOD,
AND 25/50/25 SODIUM NITRATE/AMMONIUM NITRATE/SAWDUST,
WERE FOUND SUITABLE FOR GUERRILLA WARFARE ON THE
BASIS OF FIELD TESTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-439 383

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

SURVEY OF SENSITIVITY CHARACTERISTICS OF TYPICAL
DELAY, IGNITER, FLASH, AND SIGNAL TYPE PYROTECHNIC
COMPOSITIONS, (U)

APR 64 18P KRISTAL, JOSEPH IKAYE, SEYMOUR

M. I

PROJ: 1C 52380 A302

MONITOR: PA TM 1316

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PYROTECHNICS, SENSITIVITY), (*REVIEWS,
PYROTECHNICS), VISUAL SIGNALS, SILICON, OXIDIZERS,
FRICTION, IMPACT SHOCK, FUELS, ADDITIVES, BINDERS,
ALUMINUM, BORON, CALCIUM, CALCIUM ALLOYS, CALCIUM
COMPOUNDS, MAGNESIUM ALLOYS, HYDRIDES, POTASSIUM, BARIUM
COMPOUNDS, MAGNESIUM, BOROHYDRIDES, POTASSIUM COMPOUNDS,
ZIRCONIUM, ZIRCONIUM COMPOUNDS, ZIRCONIUM ALLOYS, NICKEL
ALLOYS, PERCHOLATES, NITRATES, OXIDES, CHLORATES,
CHROMATES, POLYMERS, IGNITERS, POWDERS (U)

PYROTECHNIC COMPOSITIONS WHICH HAVE DELAY, IGNI
TER, FLASH, AND SIGNAL APPLICATIONS WERE SUBMITTED
FOR INVESTIGATION WITH REGARD TO THEIR IMPACT AND
FRICTION SENSITIVITY CHARACTERISTICS. IMPACT TESTS
WERE CONDUCTED IN ACCORDANCE WITH THE TECHNIQUE
DESCRIBED IN TECHNICAL REPORT FRLTR-25 EXCEPT
THAT THE SAMPLES WERE TESTED AS RECEIVED, WITHOUT
PERFORMING THE GRANULATION SPECIFIED. FRICTION
TESTS WERE CONDUCTED IN ACCORDANCE WITH THE PROCEDURE
OUTLINED IN PICATINNY ARSENAL TESTING MANUAL
7-1. EXTREME SENSITIVITY TO BOTH THE FRICTION AND
IMPACT TESTS WAS FOUND TO BE A FUNCTION OF THE
PARTICULAR INGREDIENTS AND THE PARTICLE SIZE OF THOSE
INGREDIENTS. IN GENERAL, THE PERCHLORATE
CONTAINING COMPOSITIONS WERE FOUND TO BE EXTREMELY
SENSITIVE TO BOTH FRICTION AND IMPACT. THE SAME IS
GENERALLY TRUE OF COMPOSITIONS CONTAINING FINELY
DIVIDED FUELS SUCH AS BORON, ZIRCONIUM, POTASSIUM
BOROHYDRIDE, ALUMINUM, MAGNESIUM, AND CALCIUM AND ITS
ALLOYS. ORGANIC ADDITIVES IN THE FORM OF BINDERS
OR COLOR INTENSIFIERS GENERALLY DO NOT DECREASE AND
MAY INCREASE SENSITIVITY TO BOTH IMPACT AND FRICTION
WHEN USED IN MODERATE AMOUNTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-446 737

NAVAL ORDNANCE LAB WHITE OAK MD

SAFETY PRINCIPLES FOR LABORATORY AND PILOT-PLANT
OPERATIONS WITH EXPLOSIVES, PYROTECHNICS, AND
PROPELLANTS.

(U)

JUL 64 112P
MONITOR: NAVWEPS OP3237

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*EXPLOSIVES, HANDLING), (*PYROTECHNICS,
SAFETY), (*PROPELLANTS, MANUFACTURING METHODS),
HANDBOOKS
IDENTIFIERS: 1964

(U)

(U)

OP 3237 IS DIRECTED AT PERSONNEL ASSOCIATED WITH
THE RESEARCH, DEVELOPMENT, AND PILOT-PLANT
MANUFACTURE OF EXPLOSIVE, PYROTECHNIC, AND PROPELLANT
MATERIALS. THE OBJECTIVE OF THE INFORMATION
PRESENTED IS TO EMPHASIZE THE IMPORTANCE OF SAFETY
PROGRAMS AND THE NECESSITY THAT ALL EMPLOYEES ADHERE
STRINGENTLY TO THEM. THE PUBLICATION WILL EXPLAIN
THE NATURE OF CERTAIN HAZARDOUS CONDITIONS AND POINT
OUT THE PROPER STEPS WHICH MUST BE FOLLOWED IN ORDER
TO ELIMINATE A HAZARDOUS CONDITION WHICH COULD LEAD
TO A SERIOUS INJURY OR EVEN DEATH. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-447 410

NAVAL AMMUNITION DEPOT CRANE IND

COLORLED FLARE INGREDIENT SYNTHESIS PROGRAM,

(U)

JUL 64 32P DOUDA, B. E. ;
REPT. NO. RDTR43

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•COLORLED FLARES, COMPLEX COMPOUNDS),
(•COMPLEX COMPOUNDS, COLORED FLARES), EMISSIVITY,
FLAMES, INORGANIC COMPOUNDS, METALORGANIC COMPOUNDS,
METALS, OXIDIZERS, STRONTIUM COMPOUNDS, PERCHLORATES,
LITHIUM COMPOUNDS, COPPER COMPOUNDS, NITRATES, SOLIDS,
STABILITY, PYROTECHNICS (U)
IDENTIFIERS: GLYCINE (TRIS) STRONTIUM II PERCHLORATE
COMPLEX, COPPER NITRATE COMPLEXES, LITHIUM PERCHLORATE
COMPLEXES (U)

A PROGRAM IS DESCRIBED FOR THE SYNTHESIS OF
COMPOUNDS WHOSE POTENTIAL USE IS FOR PRODUCTION OF
COLORED FLAMES. THEORETICAL CONSIDERATIONS WHICH
APPLY TO THE PROGRAM ARE DISCUSSED. EMPHASIS IS
PLACED UPON THE PREPARATION OF STABLE, SOLID,
INFUSIBLE, COORDINATION COMPOUNDS. THE AIM IS FOR
EACH MOLECULE OF THE COMPOUND TO CONTAIN (1) A
METAL SELECTED FOR ITS EMISSION PROPERTIES WHEN
THERMALLY EXCITED, (2) A FUEL AND OXIDANT WHICH,
WHEN INITIATED, WILL REACT WITH ONE ANOTHER TO
PROVIDE THE NECESSARY THERMAL ENERGY FOR THE METAL
EXCITATION AND SOMETIMES (3) A HALOGEN SOURCE
WHICH, UNDER SPECIFIC CONDITIONS, WILL ENHANCE THE
METAL EMISSION. A COMPOUND TENTATIVELY IDENTIFIED
AS TRIS(GLYCINE) STRONTIUM(II)PERCHLORATE IS AN
EXAMPLE THE TYPE OF STABLE COMPOUND DESIRED. THE
POTENTIAL FORMATION AND USEFULNESS OF LITHIUM
PERCHLORATE AND COMPLEXES WITH GLYCINE ARE DISCUSSED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-462 474

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

FUNDAMENTALS OF PYROTECHNICS.

(U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,

MAY 65 416P SHIDLOVSKY, A. A. :

MONITOR: PA TM-1615

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANSLATED BY U. S. JOINT
PUBLICATION RESEARCH SERVICE FROM A RUSSIAN
TEXTBOOK, OSNOVY PIROTEKHNIKI (1964).

DESCRIPTORS: (*PYROTECHNICS, TEXTBOOKS), (*TEXTBOOKS,
PYROTECHNICS), USSR, OXIDIZERS, COMBUSTION, SENSITIVITY,
STABILITY, TRACERS (ORDNANCE), ILLUMINATING PROJECTILES,
FLARES, INCENDIARY MIXTURES, SMOKE MUNITIONS, COLORED
SMOKES, IGNITION, PRODUCTION, HEAT OF FORMATION, OXIDES,
FLUORIDES, CHLORIDES, SULFIDES (U)
IDENTIFIERS: JPRS (U)

THE GENERAL THEORETICAL BASES OF PYROTECHNICS ARE
EXPOUNDED IN THE BOOK, AS WELL AS CONTEMPORARY
METHODS OF COMPILING AND CALCULATING PYROTECHNIC
COMPOSITIONS, AND INFORMATION IS GIVEN CONCERNING THE
PROPERTIES OF VARIOUS FORMS OF PYROTECHNIC
COMPOSITIONS. THE PROPERTIES OF COMPONENTS,
COMBUSTIBLES AND OXIDIZERS ARE DESCRIBED IN DETAIL.
ATTENTION IS DEVOTED TO THE PHYSICAL NATURE OF THE
PROCESSES OF COMBUSTION UNDER CONSIDERATION. THE
PROPERTIES OF VARIOUS TYPES OF PYROTECHNIC
COMPOSITIONS ARE CONSIDERED SEPARATELY
(ILLUMINATING, INCENDIARY, SOLID ROCKET FUEL,
ETC.). THE BOOK IS A TEXTBOOK FOR STUDENT IN
HIGHER TECHNICAL EDUCATIONAL INSTITUTIONS. IT WILL
ALSO BE OF INTEREST FOR SCIENTIFIC WORKERS AND
INDUSTRIAL ENGINEERS, WORKING IN THE FIELD OF
PYROTECHNICS AND IN FIELDS RELATED TO IT
(EXPLOSIVES, POWDER, ROCKET DESIGN, ETC.).
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-463 061

PICATINNY ARSENAL DOVER N J AMMUNITION ENGINEERING
DIRECTORATE

PROCESS CONTROL METHODS FOR DETERMINING SMALL AMOUNTS
OF MOISTURE IN PYROTECHNICS. I. ELECTROLYTIC
HYGROMETER.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
APR 65 460P ROTH, MILTON ;
MONITOR: PA TR-3239-PT, 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: AN EXPANDED VERSION IS AVAILABLE TO
U. S. MILITARY ORGANIZATIONS ONLY AS AD463 060L.

DESCRIPTORS: (*PYROTECHNICS, MOISTURE), (*MOISTURE,
PYROTECHNICS), (*HYGROMETERS, PYROTECHNICS), EXPLOSIVE
MATERIALS, PROPELLANTS, INSTRUMENTATION, CHEMICAL
ANALYSIS, ELECTROLYSIS, WATER, SENSITIVITY, MICROWAVE
EQUIPMENT, RADIOFREQUENCY, ATTENUATION, OPERATION (U)

A PROJECT DESIGNED TO DEVELOP PROCESS CONTROL
METHODS FOR DETERMINING THE MOISTURE CONTENT OF
PYROTECHNICS IS IN PROGRESS. THE FIRST STAGE OF
THIS PROJECT INVOLVED A SURVEY OF COMMERCIALY
AVAILABLE INSTRUMENTS. THIS REPORT DESCRIBES THE
RESULTS OF THE SURVEY AND GIVES A DETAILED EVALUATION
OF THE ELECTROLYTIC HYGROMETER, THE INSTRUMENT
CONSIDERED MOST PROMISING. LIMITED DATA OBTAINED
WITH OTHER INSTRUMENTS IS PRESENTED BUT FURTHER WORK
IS PLANNED SINCE THEY APPEAR TO OFFER ADVANTAGES NOT
ATTAINABLE BY THE ELECTROLYTIC HYGROMETER.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-467 274

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

THE PRODUCTION OF COLORED SMOKES FROM HIGHLY REACTIVE
HYDROLYZABLE METAL CHLORIDES. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,

AUG 65 34P TATYREK, ALFRED F. ;

MONITOR: PA TM-1644

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COLORED SMOKES, PRODUCTION),
(*TITANIUM COMPOUNDS, SMOKE MUNITIONS), CHLORIDES,
FEASIBILITY STUDIES, HYDRALYSIS, CHROMIUM
COMPOUNDS, VANADIUM COMPOUNDS, OXYCHLORIDES,
OXIDES, DYES, SOLUTIONS, EFFECTIVENESS,
INORGANIC COMPOUNDS, SOLUBILITY, METALORGANIC
COMPOUNDS, CHEMICAL REACTIONS, SULFUR COMPOUNDS,
PHENOLS, CYCLOPENTENES (U)
IDENTIFIERS: TITANIUM (IV) CHLORIDE, CHROMYL
CHLORIDE, VANADYL CHLORIDE, CHROMIUM (III)
OXIDE, VANADIUM PENTOXIDE, SULFUR TRIOXIDE (U)

ATTEMPTS TO PREPARE CONCENTRATED TITANIUM
TETRACHLORIDE (TiCl₄) SOLUTIONS CONTAINING
ORGANIC DYES OR COLORED INORGANIC COMPOUNDS WHICH,
WHEN RELEASED INTO THE ATMOSPHERE, WOULD PRODUCE
COLORED SMOKE CLOUDS WERE GENERALLY UNSUCCESSFUL.
ALL OF THE DYES AND COMPOUNDS EITHER REACTED WITH
THE TiCl₄ OR WERE NOT SOLUBLE ENOUGH TO COLOR THE
TiCl₄ SMOKE. SEVERAL CYCLIC ETHERS AND
SUBSTITUTED PHENOLS REACTED TO PRODUCE HIGHLY COLORED
TiCl₄ SUBSTITUTION AND ADDITION COMPOUNDS, SOME
OF WHICH SEEMED READILY SOLUBLE IN TiCl₄. A
NUMBER OF THESE COMPOUNDS REACTED RAPIDLY ENOUGH TO
PRODUCE COLORED SMOKE CLOUDS BY INSTANT INTERACTION
WITH THE TiCl₄. CHROMYL CHLORIDE
(CrO₂Cl₂) AND VANADYL CHLORIDE (VOCl₃)
WERE FOUND TO VAPORIZE AND HYDROLYZE WITH ATMOSPHERIC
MOISTURE TO FORM, RESPECTIVELY, A YELLOW CHROMIUM
TRIOXIDE SMOKE AND AN ORANGE-COLORED HYDRATED VANADIUM
PENTOXIDE SMOKE. A GREATER SMOKE DENSITY WAS
OBTAINED BY MIXING THESE COMPOUNDS WITH TiCl₄.
SEVERAL REDUCING AGENTS WERE FOUND WHICH REACTED
WITH TITANIUM TETRACHLORIDE, CHROMYL CHLORIDE, AND
VANADIUM OXYTRICHLORIDE TO PRODUCE VIOLET, BLUE, AND
GREEN SMOKE CLOUDS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-467 837

JOINT RESEARCH AND TEST ACTIVITY SAN FRANCISCO CALIF
96243

EVALUATION OF LWL SMOKE TARGET MARKER.

(U)

DESCRIPTIVE NOTE: FINAL REPT., 20 NOV 64-31 MAR 65,
JUN 65 18P CROUCH, WILLIAM E. JR.;
PROJ: 2L505-0

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COLORED SMOKES, EFFECTIVENESS),
(*SMOKE MUNITIONS, GRENADES), DESIGN,
PERFORMANCE(ENGINEERING), HANDLING, TESTS,
COUNTERINSURGENCY, MARKERS: TARGETS, JUNGLES,
PARACHUTES, VIETNAM, TERRAIN

(U)

THE PURPOSE FOR THE EVALUATION WAS TO DETERMINE IF THE LWL SMOKE TARGET MARKER WOULD PROVIDE A SATISFACTORY MARK IN JUNGLES, IN FLOODED RICE PADDIES, IN WATER AND ON DRY LAND. THE LWL SMOKE TARGET CONSISTED OF THREE AN-M8 WHITE SMOKE GRENADES MOUNTED IN TWO CONCENTRIC CYLINDERS WITH AN AIRSPACE BETWEEN THE CYLINDERS PROVIDING A FLOTATION CAPABILITY. THE TEST ITEM WAS UTILIZED BY US ARMY AVIATION UNITS AND BY A VNAF RECONNAISSANCE SQUADRON. IT WAS USED ON NORMAL COMBAT OPERATIONS UNDER VARYING TERRAIN, WEATHER AND OPERATIONAL CONDITIONS. COMPLETED QUESTIONNAIRES WERE OBTAINED FROM USING UNITS AND ADDITIONAL DATA GATHERED BY INTERVIEW AND DISCUSSION WITH USING PERSONNEL THE LWL SMOKE TARGET MARKER PRODUCED AN EFFECTIVE MARK ON VARYING TYPES OF TERRAIN FOUND IN VIETNAM. IT WAS USED PRIMARILY AS A LANDING ZONE MARKER FOR AIRMOBILE OPERATIONS, AS ITS SIZE AND WEIGHT PRECLUDED USE AS A MARKER FOR RANDOM SOURCES OF GROUND FIRE ENCOUNTERED BY AIRCRAFT DURING OPERATIONS. A DISPENSER, MOUNTED EXTERNALLY TO THE AIRCRAFT, WAS DETERMINED TO BE DESIRABLE AND A DESIGN SUGGESTED TO LWL. BASED ON COMMENTS OF USING UNIT, THE U.S. ARMY SUPPORT COMMAND -- VIETNAM REQUESTED THAT THE MARKERS BE PROCURED FOR OPERATIONAL EMPLOYMENT IN VIETNAM. ACTION ON THIS REQUEST IS PENDING. IT WAS DETERMINED THAT THE LWL MARKER DID PROVIDE A MEANS OF MARKING THAT HERETOFORE HAS NOT BEEN AVAILABLE TO OPERATIONAL UNITS. THE COMBAT EFFECTIVENESS AND EFFICIENCY OF AIRMOBILE OPERATIONS IS IMPROVED BY USE OF THIS TYPE MARKER. (AUTHOR)

(U)

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/ZOM08

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-472 872

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

THE EFFECTS OF PROCESSING ON PYROTECHNIC INGREDIENTS.
PART I: COMPRESSIBILITY OF POWDERED MAGNESIUM AND
SODIUM NITRATE AT CONSOLIDATION PRESSURES TO 10,000
PSI. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

SEP 65 25P MIDDLEBROOKS, DORIS E. I

KAYE, SEYMOUR M. I

PROJ: DA1C523801A302

MONITOR: PA TR-3252

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, RELIABILITY),
(*PROCESSING, *PYROTECHNICS), (*MAGNESIUM,
*PYROTECHNICS), PARTICLE SIZE, PERMEABILITY,
POROSITY, COMPRESSIVE PROPERTIES, POWDERS,
SODIUM COMPOUNDS, NITRATES, HIGH PRESSURE
RESEARCH, REPRODUCTION, BURNING RATE (U)

NONREPRODUCIBILITY OF ILLUMINANCE LEVELS AND
BURNING RATES HAS LONG BEEN A PROBLEM WITH
PYROTECHNIC COMPOSITIONS. ONE ASPECT OF THIS
PROBLEM IS THE EFFECTS OF BLENDING AND CONSOLIDATION
ON THE SHAPE AND SIZE OF THE PARTICLES. IF THE
EFFECTS OF CONSOLIDATION PRESSURE ON PARTICLE SIZE,
PERMEABILITY, OR POROSITY VARY EXCESSIVELY, SUCH
VARIATIONS MAY CAUSE NONREPRODUCIBLE END-ITEM
PERFORMANCE. AN INVESTIGATION REVEALED THAT
INCREASING THE LOADING PRESSURES TO 10,000 PSI ON 44,
124 AND 347 MICRON NaN_3 CAUSES REGULAR DECREASES
IN PERMEABILITY AND POROSITY. THE 44- AND 124-
MICRON FRACTIONS SHOWED LITTLE OR NO PARTICLE SIZE
CHANGE WITH INCREASING CONSOLIDATION PRESSURE, WHILE
THE 350-MICRON FRACTION SHOWED A REGULAR DECREASE.
WHEN 28.3- AND 187-MICRON MG POWDERS WERE
SIMILARLY CONSOLIDATED AND EVALUATED, THEIR PARTICLE
SIZES REMAINED CONSTANT WHILE THEIR PERMEABILITY AND
POROSITY DECREASED WITH INCREASING LOADING PRESSURE.
THE DATA REVEALED NO ERRATIC TRENDS IN PARTICLE
SIZE, PERMEABILITY, OR POROSITY. THE VALUES
OBTAINED SHOWED TRENDS CONSISTENT WITH THE PLASTICITY
AND FRANGIBILITY OF THE INGREDIENTS. IT WAS
CONCLUDED THAT CONSOLIDATION PER SE IS NOT THE CAUSE
OF THE NONREPRODUCIBILITY OBSERVED IN THE PERFORMANCE
OF PRESSED PYROTECHNIC END ITEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-474 350 1971
CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL
MD

HUMAN FACTORS EVALUATION OF THE E24 CS MUNITION. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,
OCT 65 19P LEWIS, JOHN W. ;
REPT. NO. CRDL-TM-2-34
PROJ: 1C522301A079

UNCLASSIFIED REPORT

DESCRIPTORS: (*GRENADES,
PERFORMANCE(ENGINEERING)), (*SMOKE MUNITIONS,
HUMAN ENGINEERING), RIFLE GRENADE LAUNCHERS,
PROTECTIVE CLOTHING, HAZARDS, QUALITY CONTROL,
CS AGENTS, PORTABLE, HANDLING, FIRING
TESTS(ORDNANCE), CIRCULAR ERROR PROBABLE,
TERMINAL BALLISTICS, FIRING
MECHANISMS(AMMUNITION) (U)
IDENTIFIERS: 40-MM ORDNANCE ITEMS, M-79 GRENADE
LAUNCHERS, E-24 GRENADES (U)

A HUMAN FACTORS EVALUATION OF THE CARTRIDGE, 40
MM, RIOT CONTROL, CS, E24 REVEALED THAT THIS
DEVICE CAN BE FIRED BY THE M79 LAUNCHER AND BY
HAND. HOWEVER, ACCURACY OF THE DEVICE IN THE HANDS
OF RELATIVELY UNTRAINED PERSONNEL IS LOW, AND IS MUCH
LESS WHEN FIRED BY HAND THAN WHEN FIRED FROM THE
M79 LAUNCHER. ALSO, HAND-FIRING HAS SOME DEGREE
OF HAZARD AND SHOULD NOT BE RESORTED TO ROUTINELY.
THE DESIGN OF THE BANDOLIER IS ADEQUATE, BUT
QUALITY CONTROL OF POCKET SIZE IS NECESSARY. THE
SEALING TAPE ON THE MUNITION IS DIFFICULT TO REMOVE.
TRAINING, AS DIFFERENTIATED FROM ORIENTATION IN THE
USE OF THE DEVICE, INCLUDING TEST FIRINGS, IS NEEDED
FOR ALL PERSONNEL WHO WILL BE REQUIRED TO USE IT.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-474 401 19/1 15/2
AMCEL PROPULSION CO ASHEVILLE N C

INVESTIGATION OF HAZARDS IN THE PROCESSING OF
PYROTECHNIC MIXTURES FOR CHEMICAL AGENT MUNITIONS. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 JUL-1 DEC
64.

MAR 65 103P
REPT. NO. ATR-50
CONTRACT: DA-18-035-AMC-296(A)

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *HAZARDS),
PROCESSING, CHEMICAL WARFARE AGENTS, WARHEADS,
INCAPACITATING AGENTS, IGNITION, ACCIDENTS,
SENSITIVITY, IMPACT SHOCK, FRICTION, HEAT,
STATIC ELECTRICITY, HUMIDITY, LIGHT, PARTICLE
SIZE, SULFUR, CHLORATES, POTASSIUM COMPOUNDS,
LACTOSE, SUCROSE, PRESSURE, TEMPERATURE,
BURNING RATE, VACUUM, STABILITY, SMOKE
MUNITIONS, DIFFERENTIAL THERMAL ANALYSIS (U)
IDENTIFIERS: BZ (U)

DURING THIS PROGRAM IN THE INVESTIGATION OF HAZARDS
ENCOUNTERED IN THE PROCESSING OF PYROTECHNIC MIXTURES
FOR CHEMICAL AGENT MUNITIONS, A STUDY AND EVALUATION
WERE UNDERTAKEN TO DETERMINE FACTORS CAUSING
ACCIDENTAL IGNITION OF PYROTECHNIC MIXTURES DURING
MANUFACTURE. STEPS WERE ALSO DETERMINED TO BETTER
PROTECT PERSONNEL DURING PROCESSING OF THESE MIXTURES
FROM POTENTIAL HAZARDS AND TO AVOID AND ELIMINATE
THESE HAZARDS. AS THE PROGRAM PROGRESSED,
CONTINUED INVESTIGATION MADE NECESSARY SPECIFIC TESTS
SUCH AS IMPACT SENSITIVITY, VACUUM THERMAL STABILITY,
AUTO-IGNITION TEMPERATURE, AND DIFFERENTIAL THERMAL
ANALYSIS. TESTS WERE EVENTUALLY EXTENDED TO
INCLUDE THE EFFECTS OF IMPURITIES, VARIATION IN THE
COMPOSITION OF FORMULATIONS, EFFECTS OF PARTICLE SIZE
ON SULFUR-POTASSIUM CHLORATE, SUCROSE AND LACTOSE
FORMULATIONS, SMOKE MIXTURES WITH SULFUR OR LACTOSE,
AND THE EFFECTS OF ADDITIVES FOR THE PURPOSE OF
IMPROVED BLENDING. PRESSURE-TEMPERATURE-RISE
STUDIES WERE INVESTIGATED AS WELL AS THE TESTING OF
BZ PYROTECHNIC MIXTURES USING AN ACTIVE AGENT.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-474 403 19/1
ARMY CHEMICAL WARFARE LABS ARMY CHEMICAL CENTER MD

THE TOXICITY OF COMBUSTION PRODUCTS OF
PYROTECHNICS.

(U)

DESCRIPTIVE NOTE: TECHNICAL MEMO. 7 AUG-26 OCT 59,
MAY 60 27P WEEKS ,MAURICE H. ;
REPT. NO. CWL-TM-26-12

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *TOXICITY), COLORED
FLARES, COLORED SMOKES, FLARES, SMOKE MUNITIONS,
TEST METHODS, LABORATORY ANIMALS

(U)

THE TOXIC PROPERTIES OF NINE PYROTECHNIC ITEMS WERE
DETERMINED FROM A STUDY OF THE INHALATION TOXICITY OF
THEIR COMBUSTION PRODUCTS. THE CHEMICAL
COMPOSITION AND PHYSICAL PROPERTIES OF THESE
COMBUSTION PRODUCTS PROBABLY BOTH PLAY IMPORTANT, BUT
NOT NECESSARILY INDEPENDENT, ROLES IN THE PRODUCTION
OF TOXIC RESPONSES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-474 437 1971
CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL
MD

BURNING TEMPERATURES AND PRESSURES OF M18 COLORED-
SMOKE GRENADES. (U)

DESCRIPTIVE NOTE: REPT. FOR MAY-AUG 64,
OCT 65 19P HAYNES, GUY ;
REPT. NO. CRDL-SPECIAL PUB-1-54
TASK: 1C522301A08101

UNCLASSIFIED REPORT

DESCRIPTORS: (*GRENADES, *SMOKE MUNITIONS),
(*COLORED SMOKES, GRENADES), BURNING RATE,
TEMPERATURE, TRANSDUCERS, THERMOCOUPLES,
PRESSURE (U)
IDENTIFIERS: M-18 GRENADES (U)

PARAMETERS PERTAINING TO PYROTECHNIC DISSEMINATION
PROCESSES WERE INVESTIGATED. BURNING-TEMPERATURE,
BURNING-TIME, WEIGHT-CHANGE, AND PRESSURE PARAMETERS
WERE RECORDED FOR THE M18, COLORED-SMOKE GRENADE
WITH A THERMOCOUPLE, FROM PRESSURE- OR WEIGHT-LOSS
CURVES, WITH A WEIGHT TRANSDUCER, AND WITH A PRESSURE
TRANSDUCER, RESPECTIVELY. EQUIPMENT LAYOUTS AND
SAMPLES OF STRIP-CHART RECORDINGS ARE PRESENTED.
BURNING PRESSURE IS USUALLY LESS THAN 1 PSI;
HOWEVER, ORIFICE PLUGGING CAN INCREASE PRESSURE TO
ABOUT 20 PSI. ANY ONE TYPE OF MUNITION YIELDS A
GREAT VARIATION IN FUNCTIONING DATA. BURNING
TEMPERATURE IS LOWER IN RED AND YELLOW M18 GRENADES
THAN IN GREEN AND VIOLET ONES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-477 103 19/1 1/3
DEVELOPMENT AND PROOF SERVICES ABERDEEN PROVING GROUND
MD

ENGINEERING TEST (SAFETY RELEASE) OF AERIAL SMOKE
MARKER AND SMOKE MARKER DISPENSER, SMD-1. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JAN 66 25P KERTIS, PAUL E. I
REPT. NO. DP5-1866
PROJ: RDTE-2X625301D718 ,USATECOM-4-5-2980-08

UNCLASSIFIED REPORT

DESCRIPTORS: (*SMOKE MUNITIONS,
EJECTORS(ORDNANCE)), GRENADES, RELEASE
MECHANISMS, ENVIRONMENTAL TESTS,
PERFORMANCE(ENGINEERING), VIBRATION, EXTERNAL
STORES, AVIATION SAFETY, HELICOPTERS, OBSERVATION
PLANES, SMALL ARMS AMMUNITION, FIRING
TESTS(ORDNANCE), MODEL TESTS, FLIGHT TESTING,
AIRBORNE (U)
IDENTIFIERS: H-1 AIRCRAFT, O-1 AIRCRAFT, SMD-
1 DISPENSERS, M-8 GRENADES (U)

AN ENGINEERING TEST (FOR SAFETY RELEASE ONLY)
WAS CONDUCTED ON THE WHITE AERIAL SMOKE MARKER AND
SMOKE MARKER DISPENSER, SMD-1, AT ABERDEEN
PROVING GROUND FROM 30 SEPTEMBER TO 3
DECEMBER 1965. THE SYSTEM WAS FOUND TO BE
STRUCTURALLY SAFE AND COMPATIBLE WITH THE O-1A AND
UH-1B AIRCRAFT. IT WAS POSSIBLE THAT A MARKER
COULD BE IGNITED AND HUNG IN THE DISPENSER FROM THE
EFFECTS OF SMALL ARMS FIRE; HOWEVER, THE MARKER
BURNING INSIDE THE DISPENSER, DID NOT CONSTITUTE A
SIGNIFICANT HAZARD TO THE AIRCRAFT. IT WAS
RECOMMENDED THAT THE SYSTEM BE CONSIDERED SAFE FOR
USE ON BOTH TYPES OF AIRCRAFT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZDM08

AD-479 680 19/1
DENVER RESEARCH INST COLO MECHANICS DIV

A NEW SMOKE SCREENING CHEMICAL FOR USE IN AERIAL
SMOKE TANKS.

(U)

DESCRIPTIVE NOTE: SUMMARY PROGRESS REPT. NO. 6
(FINAL),

DEC 65 219P MCLAIN, WILLIAM H. EVANS,
ROBERT W. I

REPT. NO. DR1-2304, 448-6512-F

CONTRACT: DA-18-035-AMC-127(A)

UNCLASSIFIED REPORT

DESCRIPTORS: (*SMOKE MUNITIONS, FEASIBILITY
STUDIES), (*SMOKE GENERATORS, AIRCRAFT
EQUIPMENT), WHITE PHOSPHORUS, PHOSPHORUS
COMPOUNDS, SULFIDES, PYROPHORIC MATERIALS, SAFETY,
HANDLING, FLAMES, INHIBITION, METHANE, IODINE
COMPOUNDS, TITANIUM COMPOUNDS, METALORGANIC
COMPOUNDS, MIXTURES, AMMONIA, SULFUR COMPOUNDS,
OXIDES, CHLORINE COMPOUNDS, SULFONIC ACIDS,
EFFECTIVENESS, DENSITY, CLOUDS, AREA COVERAGE,
TOXICITY, CORROSION

(U)

IDENTIFIERS: FS, PHOSPHORUS SESQUISULFIDE,
METHANE/DIiodo, SULFUR TRIOXIDE, CHLOROSULFONIC
ACID

(U)

A REVIEW OF THE LITERATURE FOR CHEMICAL SMOKE
AGENTS IS PRESENTED. BASED ON THIS REVIEW AN
EXPERIMENTAL PROGRAM TO EVALUATE NEW LIQUID SMOKE
AGENTS WAS FORMULATED. THE RESULTS OF THIS
EXPERIMENTAL PROGRAM INDICATED THAT LIQUID AGENTS
POSSESSING AN OBSCURING POWER GREATER THAN FS CAN
BE DEVELOPED USING SELECTED MIXTURES, SOLUTIONS, AND
COMPOUNDS OF PHOSPHORUS. A SOLUTION OF 33 WEIGHT
% METHYLENE IODIDE IN WHITE PHOSPHORUS HAD A TOP
OF ABOUT 2800. A EUTECTIC MIXTURE OF PHOSPHORUS
SESQUISULFIDE AND WHITE PHOSPHORUS HAD A TOP OF
ABOUT 2800. THE MAJOR DIFFICULTY OF THE AGENTS
TESTED WAS THEIR PYROPHORICITY WHICH RESULTED IN
HANDLING DIFFICULTIES. CONSIDERABLE REDUCTION IN
THE RATE OF OXIDATION WAS ACCOMPLISHED USING
METHYLENE IODIDE AS A FLAME INHIBITING AGENT.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-481 387

19/1

DOW CHEMICAL CO MIDLAND HIGH SCIENTIFIC PROJECTS LAB

POLYMER-BASED PYROTECHNIC FORMULATIONS FOR THE
DISSEMINATION OF COLORED SMOKES.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL SUMMARY REPT. 13 APR
64-13 FEB 65,

APR 65

18P

LANE ,GEORGE A. ;JANKOWIAK,E.

M. ;

CONTRACT: DA-18-035-AMC-118(A)

UNCLASSIFIED REPORT

DESCRIPTORS: (*EPOXY PLASTICS, *PYROTECHNICS),
(*COLORED SMOKES, FEASIBILITY STUDIES), BINDERS,
AROMATIC COMPOUNDS, SULFIDES, COLORED SMOKES,
SYNTHETIC RUBBER, POLYMERS, COPOLYMERIZATION,
AGING(MATERIALS), O-HETEROCYCLIC COMPOUNDS,
ETHERS, GLYCEROLS, CATALYSTS, EXTRUSION,
CASTING, ADHESION, THERMAL EXPANSION,
COMBUSTION, SCATTERING, BURNING RATE, AMINES,
BENZENE, VISCOSITY, PARTICLE SIZE, CHLORATES,
POTASSIUM COMPOUNDS, SURFACE-ACTIVE SUBSTANCES
IDENTIFIERS: POLYSULFIDE RUBBER, GLYCERINE
DIGLYCIDYLETHER, POTASSIUM CHLORATE

(U)

(U)

THIS REPORT PRESENTS THE RESULTS OF A TEN-MONTH
PROGRAM TO DEVELOP CASTABLE OR EXTRUDABLE PYROTECHNIC
FORMULATIONS FOR THE THERMAL DISSEMINATION OF COLORED
SMOKE. THE ADVANTAGES OF THESE FORMULATIONS OVER
THE CONVENTIONAL PRESSED GRAINS ARE EXTENSIVE,
RELATING TO INCREASED SAFETY AND EASE OF PROCESSING,
IMPROVED ECONOMICS, AND WIDER APPLICABILITY. IN
ORDER TO BE USEFUL, THE FORMULATIONS DEVELOPED SHOULD
HAVE THE PROPERTIES OF CURING AT ROOM OR SLIGHTLY
ELEVATED TEMPERATURE TO A TOUGH STRONG GRAIN WHICH
WILL MAINTAIN ITS SHAPE UNDER SURVEILLANCE AT 70 C.
THE GOAL HAS BEEN ALSO TO PRODUCE AN EASILY
IGNITED, REPRODUCIBLE, SMOOTH BURNING FORMULATION,
WHICH WILL YIELD A COLORED SMOKE OF A QUALITY
COMPARABLE TO THAT OF CURRENT PRESSED-GRAIN STANDARD
FORMULATIONS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-602 687

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

FOUNDATIONS OF PYROTECHNICS,

(U)

APR 64 439P SHIDLOVSKII, A. A. ;
REPT. NO. FTD-TT-63-758

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF MONO.
OSNOVY PIROTEKHNIKI, MOSCOW, 1954, 284P.

DESCRIPTORS: (*PYROTECHNICS, TEXTBOOKS), INCENDIARY
MIXTURES, PRIMERS, COMBUSTION, OXIDIZERS, CHEMICAL
REACTIONS, STABILITY, STORAGE, COLORED SMOKES,
ILLUMINATING PROJECTILES, SENSITIVITY, THERMOCHEMISTRY,
EXPLOSIVE MATERIALS, TRACERS (ORDNANCE), CLASSIFICATION,
USSR (U)

THE FIRST PART OF THE BOOK PRESENTS INFORMATION
CONCERNING THE PRINCIPLES ON WHICH PYROTECHNIC
COMPOUNDS ARE CONSTITUTED, A CLASSIFICATION FOR THEM
AND THEIR PHYSICOCHEMICAL PROPERTIES, WITH COMMON
REFERENCE TO ALL TYPES OF COMPOSITIONS. THE SECOND
PART OF THE BOOK IS DEVOTED TO A DESCRIPTION OF THE
INDIVIDUAL TYPES OF PYROTECHNIC COMPOSITIONS, THEIR
SPECIFIC PROPERTIES AND THE SPECIFICATIONS SET FORTH
FOR THEM. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZDM08

AD-606 335

TRW SPACE TECHNOLOGY LABS LOS ANGELES CALIF

APPLICATION OF A DISCRETE LINE EMISSION SOURCE TO
DAYLIGHT BALLISTIC PHOTOGRAPHY, (U)

MAY 58 3P WEBBER, D. S. ; SATTEN, R. A. ;
REPT. NO. STL/GM-TR-0165-00381

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
CALIFORNIA UNIV., LOS ANGELES.

DESCRIPTORS: (*BALLISTIC CAMERAS, DESIGN), (*PHOTOFLASH
CARTRIDGES, BALLISTIC CAMERAS), (*LINE SPECTRUM,
POTASSIUM), LIGHT, EXCITATION, HEAT OF ACTIVATION,
DISSOCIATION, POTASSIUM COMPOUNDS, MAGNESIUM COMPOUNDS,
ALUMINUM COMPOUNDS, HALOGEN COMPOUNDS, INTENSITY,
PHOTOGRAPHIC FILTERS, NARROWBAND, GUIDED MISSILES,
TESTS, BALLISTICS, PHOTOGRAPHY (U)

ON THE BASIS OF LONG-RANGE BALLISTIC MISSILE
TESTING REQUIREMENTS, CRITERIA ARE PRESENTED FOR AN
OPERATIONAL DAYLIGHT CAPABILITY FOR BALLISTIC
CAMERAS. IT IS SHOWN THAT THESE CRITERIA CAN BE
MET WITH PRESENT CAMERA EQUIPMENT, NARROW BAND
INTERFERENCE FILTERS, AND IMPROVED PHOTOFLASH
CARTRIDGES. THE NECESSARY IMPROVEMENT OF THE
CARTRIDGES CONSISTS OF INCREASING THE OUTPUT IN THE
POTASSIUM RESONANCE LINES OF THE STANDARD 'DAISY'
PHOTOFLASH CARTRIDGE BY A FACTOR OF ABOUT SIX.
THEORETICAL CONSIDERATIONS AND EXPERIMENTAL DATA
ARE PRESENTED WHICH INDICATE THAT SUCH IMPROVEMENT IS
QUITE FEASIBLE. RECOMMENDATIONS ARE MADE FOR A
PROGRAM TO ACHIEVE THE IMPROVEMENT OF THE LIGHT
SOURCE AND TO DEVELOP THE NECESSARY TECHNIQUES FOR A
COMPLETE BALLISTIC CAMERA DAYLIGHT CAPABILITY.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-607 490

NAVAL AMMUNITION DEPOT CRANE IND

RELATIONSHIPS OBSERVED IN COLORED FLAMES,

(U)

SEP 64 20P DOUDA, B. E. ;

REPT. NO. NAD-CR-RDTR-45

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: LEGIBILITY OF THIS DOCUMENT IS IN PART UNSATISFACTORY. REPRODUCTION HAS BEEN MADE FROM BEST AVAILABLE COPY.

DESCRIPTORS: (*COLORED FLARES, FLAMES), (*FLAMES, CHROMATOGRAPHIC ANALYSIS), COLORS, LINE SPECTRUM, SODIUM, MAGNESIUM, BARIUM, STRONTIUM, EXCITATION, IMPURITIES

(U)

EXCITATION PURITY OF A SODIUM-YELLOW FLAME WAS OBSERVED TO BE A DECREASING FUNCTION OF THE MAGNESIUM CONTENT IN THE FLARE. THE CHROMATICITY COORDINATES REPRESENTING A WIDE VARIETY OF SODIUM-YELLOW, BARIUM-GREEN AND STRONTIUM-RED FLARES WHEN PLOTTED ON A CHROMATICITY DIAGRAM APPEAR TO TAKE THE FORM OF STRAIGHT LINES WHICH CONVERGE TOWARD A COMMON POINT. SEVERAL THEORIES ARE PROPOSED TO EXPLAIN THE OBSERVATIONS, THE CONVERGENCE POINT AND THE INTERCEPT POINT OF THE CONVERGENCE LINE WITH THE CHROMATICITY DIAGRAM PERIMETER. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-609 381

THOMPSON RAMO WOOLDRIDGE INC LOS ANGELES CALIF

SOME EFFECTS OF EXPLODING PHOTOFLASH BOMBS ON THE
TRANSMISSION OF RADIO WAVES,

(U)

NOV 56 29P ROBINSON, LAWRENCE BAYLOR ;
REPT. NO. GM-TR-97
CONTRACT: AF18 600 1190

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PHOTOFLASH BOMBS, RADIOFREQUENCY
INTERFERENCE), (*RADIOFREQUENCY INTERFERENCE, PHOTOFLASH
BOMBS), PYROTECHNICS, EXPLOSION EFFECTS, RADIO
INTERFERENCE, RADIO TRANSMISSION, PHOTOFLASH AMMUNITION,
BARIUM COMPOUNDS, POTASSIUM COMPOUNDS, NITRATES,
CHLORATES, ALUMINUM, VAPORS, SPHERES, ELECTROMAGNETIC
WAVE REFLECTIONS, ATTENUATION

(U)

THE EXPLOSION OF A SPECIFIC PHOTOFLASH POWDER IS
CONSIDERED AS A SIMPLE CHEMICAL REACTION. THE
COMPOSITION OF THE POWDER IS 30% $\text{Ba}(\text{NO}_3)_2$, 30%
 KClO_4 , 40% AL. THE TEMPERATURE OF THE
REACTION IS CALCULATED TO BE 4000K AND THE PRESSURE
DEVELOPED IS 6000 ATMOSPHERES. THE INITIAL SAHA
EQUILIBRIUM ELECTRON DENSITY DEVELOPED IS 10 TO THE
20TH POWER ELECTRONS/CC. THESE ELECTRONS,
UNIFORMLY DISTRIBUTED IN A SPHERICAL CLOUD OF
ALUMINUM VAPOR AND NITROGEN (GASEOUS EXPLOSION
PRODUCTS), WOULD MAKE SUCH A SPHERE (UP TO 10 FT
RADIUS) OPAQUE TO RADIO WAVES OF FREQUENCIES UP TO
10,000 MEGACYCLES/SEC. FOR SUCH FREQUENCIES, THE
RATIO OF FLUX INCIDENT UPON THE CLOUD OF RADIUS A TO
THAT SCATTERED A DISTANCE R AWAY IS ROUGHLY $S \text{ SUB } 1/S \text{ SUB } 5 = 1/4 (A/R)$ TO THE 2ND POWER.
FOR LARGE RADIUS, THE ATTENUATION AND REFLECTION
COEFFICIENTS CAN BE DETERMINED. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-613 006

TACTICAL AIR COMMAND LANGLEY AFB VA

OPERATIONAL TEST AND EVALUATION AERIAL SIGNAL
FLARE.

(U)

MAR 65 25P
REPT. NO. TAC-TR-64-621

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•FLARES, PERFORMANCE (ENGINEERING)),
(•PACKAGING, FLARES), TACTICAL AIR COMMAND, PACKAGING,
SURVIVAL KITS, FOILS, BURNING RATE, AVIATION PERSONNEL,
FLIGHT CLOTHING, OPERATION, VISUAL SIGNALS, ALUMINUM (U)

THIS TEST WAS CONDUCTED TO DETERMINE THE
SUITABILITY OF PACKAGING, AND OPERATIONAL
ACCEPTABILITY OF THE EX 79 MOD 0 SIGNAL KIT.
TESTS WERE ALSO CONDUCTED TO DETERMINE THE
OPERATIONAL CAPABILITY OF THE SIGNAL FLARE AND DEFINE
DEFICIENCIES IN THE PRESENT CONFIGURATION. THE
PACKAGING METHOD FOR THE FLARE KIT IS CONSIDERED
UNSUITABLE. THE KRAFT ALUMINUM FOIL OVERWRAP
WEARS THROUGH AFTER LITTLE USE AND HAS MORE BULK THAN
NECESSARY. SOME MINOR DEFICIENCIES WERE REVEALED
IN THE PENGUN WHICH WILL BE EASILY CORRECTED. THE
PENGUN FLARE KIT HAS EXTREMELY HIGH AIRCREW
ACCEPTABILITY AND A HIGH PERCENTAGE PREFERRED TO
CARRY THE KIT IN THE FLIGHT CLOTHING. THE
CARTRIDGES FURNISHED IN THE KIT DEMONSTRATED HIGH
RELIABILITY AS NOT A SINGLE FAILURE WAS RECORDED OUT
OF THE HUNDREDS FIRED DURING THE TEST. THE AVERAGE
BURNING TIME FOR THE FLARES WAS 3.64 SECONDS. THE
AVERAGE ALTITUDE AS DETERMINED BY PHOTOTHEODOLITE WAS
275.4 FEET. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-616 729

NAVAL AMMUNITION DEPOT CRANE IND

EXPERIMENTAL HIGH INTENSITY FLARE SYSTEMS DATA
REDUCTION AND ANALYSIS.

(U)

MAY 65 30P CHIPMAN, RALPH I
REPT. NO. RDTR-57
MONITOR: IDEP 347.25.00-00-X9-01

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SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY
LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF
REQUESTED BY USERS OF DDC. COPY IS AVAILABLE FOR PUBLIC
SALE.

DESCRIPTORS: (*FLARES, BRIGHTNESS), DATA,
ANALYSIS, MEASUREMENT, BURNING, LIGHT,
EXPERIMENTAL DATA

(U)

THE DATA FROM THE EXPERIMENTAL HIGH INTENSITY FLARE
SYSTEMS WAS REDUCED TO FOOT-CANDLE, CANDLEPOWER, AND
AVERAGE CANDLEPOWER MEASUREMENTS AND WAS ANALYZED FOR
SIGNIFICANCE. THERE WAS NO LARGE SIGNIFICANT
DIFFERENCE IN CANDLEPOWER SHOWN BETWEEN SYSTEMS OF
FLARES. THE HORIZONTAL MULTIPLE FLARE SYSTEMS
RATED SLIGHTLY HIGHER IN AVERAGE CANDLEPOWER THAN THE
VERTICAL MULTIPLE FLARE SYSTEMS. THE CANDLEPOWER
WAS APPROXIMATELY DIRECTLY PROPORTIONAL TO THE CROSS
SECTIONAL AREA OF THE FLARE. THERE WAS GOOD
CORRELATION BETWEEN TUNNEL DATA AND MAPI DATA FOR
THE MK 24 FLARES. THE BURNING RATES FOR ALL
SYSTEMS WERE ABOUT THE SAME. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOH08

AD-620 381

FRANKFORD ARSENAL PHILADELPHIA PA SMALL CALIBER
ENGINEERING DIRECTORATE

DEVELOPMENT OF A WIRE LANYARD TO INCREASE ARMING
DISTANCE OF FLARE, AIRCRAFT, PARACHUTE, MK24. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
AUG 65 39P GRANDY, A. J. ;
MONITOR: FA R-1772

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ARMING DEVICES, AIRCRAFT FLARES),
(*AIRCRAFT FLARES, ARMING DEVICES), WIRE,
PARACHUTES, HELICOPTERS, ILLUMINATION, MILITARY
TACTICS, COILS, WINDING, TORQUE, PACKAGING,
DROP TESTING (U)
IDENTIFIERS: LANYARDS, MK 24 AIRCRAFT FLARE (U)

THE MK 24 AIRCRAFT FLARE IS USED FOR
ILLUMINATION OF BATTLE AREAS DURING TACTICAL NIGHT
SITUATIONS AND CAN BE LAUNCHED FROM THE INTERIOR OR
EXTERIOR OF FIXED OR ROTARY WING AIRCRAFT. ERRATIC
PERFORMANCE OF THE FUZE ARMING TRAIN IN THE FLARE HAS
DICTATED A NEED TO INCREASE THE ARMING DISTANCE
ESPECIALLY WHEN THE FLARE IS MANUALLY LAUNCHED FROM
HELICOPTERS. THE OBJECT OF THIS PROGRAM WAS TO
DEVELOP A SMALL, LIGHTWEIGHT WIRE PACKAGE THAT COULD
BE EASILY ATTACHED TO THE FLARE. THE PACKAGE WOULD
PROVIDE A 50-FOOT ARMING DISTANCE PRIOR TO ACTUATION
OF THE FUZE TRAIN. ORIGINALLY, A SPOOL OF HIGH
STRENGTH STEEL WIRE WITH 'TORQUE' INDUCED WINDINGS
WAS CONSIDERED FOR THE APPLICATION. A TORQUE
INDUCED WINDING IS ONE WHERE A TORSIONAL ENERGY IS
INTRODUCED TO THE WIRE DURING THE WINDING PROCESS,
DURING PAYOUT THE WIRE WILL THUS BE FREE OF
STRESSES NORMALLY RESULTING FROM THE UNCOILING OF THE
WIRE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-623 454

NAVAL AMMUNITION DEPOT CRANE IND

DEVELOPMENT OF A CONTAINER FOR THE MK 54 PHOTOFLASH
CARTRIDGES AND MK 18 ARTILLERY AIR BURST SIMULATORS,

(U)

DESCRIPTIVE NOTE: FINAL REPT.;

SEP 65 21P CONNER, CHARLES A. ;

REPT. NO. RDTR-68

MONITOR: IDEP 347.23.00.00-X9-03

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PHOTOFLASH CARTRIDGES, CONTAINERS),
(*TRAINING AMMUNITION, CONTAINERS), (*PACKAGING,
AMMUNITION), ARTILLERY, AIRBURST, SIMULATORS,
HANDLING, PACKING MATERIALS, FOAMS, STYRENE
PLASTICS

(U)

IDENTIFIERS: MARK-54 CARTRIDGES, MARK-18 AIR BURST
SIMULATORS

(U)

THIS REPORT DESCRIBES A CONTAINER THAT HAS BEEN
DEVELOPED AND EVALUATED FOR PACKAGING THE MK 54
PHOTOFLASH CARTRIDGES AND THE MK 18 ARTILLERY
AIR BURST SIMULATORS. THE RECOMMENDED
CONTAINER HOLDS TWENTY SIX CARTRIDGES OR SIMULATORS,
WITH EACH CARTRIDGE OR SIMULATOR IN A CONTOURED
CAVITY. THE CONTAINER IS CONSTRUCTED OF EXPANDED
BEAD-TYPE POLYSTYRENE PLASTIC FOAM MATERIAL THAT IS
ECONOMICAL AND LIGHT IN WEIGHT. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-624 607 19/1 1/3
PITMAN-DUNN RESEARCH LABS FRANKFORD ARSENAL PHILADELPHIA
PA

A SURVEY OF SOME OF THE RECENT APPLICATIONS OF
PYROTECHNICS TO SMALL ARMS AMMUNITION AND MILD
DETONATING FUSE SYSTEMS.

(U)

DESCRIPTIVE NOTE: TECHNICAL RESEARCH ARTICLE,
NOV 65 159P CAVELL, WINSTON W. ;
REPT. NO. A65-9
CONTRACT: AF 33(657)-13904; ARPA ORDER-104
PROJ: VT/5052, AF-8100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AMERICAN ORDNANCE
ASSOCIATION MILITARY PYROTECHNICS SECTION MEETING,
U. S. NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIF.,
4-5 NOV 65.

DESCRIPTORS: (*PYROTECHNICS, REVIEWS), (*SMALL
ARMS AMMUNITION, PYROTECHNICS),
(*FUZES(ORDNANCE), PYROTECHNICS),
(*JETTISONABLE COCKPITS, FUZES(ORDNANCE)), DELAY
ELEMENTS(EXPLOSIVE), DETONATIONS, DEFLAGRATION,
IGNITION, EXPLOSIVE MATERIALS,
TRACERS(ORDNANCE), BOOSTERS

(U)

MILD DETONATING FUSE (MDF) APPLICATIONS TO
AIRCRAFT ESCAPE SYSTEMS ARE PRESENTED. THE
EXPLOSIVE COMPONENTS FOR MDF SYSTEMS ARE DISCUSSED.
EXPLOSIVES AND PYROTECHNICS WITH HIGH STABILITY
TEMPERATURES ARE NEEDED TO INCREASE THE ABILITY OF
THE EXPLOSIVE COMPONENTS TO WITHSTAND TEMPERATURES
ENCOUNTERED ON AERODYNAMIC HEATING OR IN HIGHLY
IONIZED MEDIA. DESIRED PROPERTIES OF EXPLOSIVES
ARE LISTED, AND MECHANICAL AND THERMOCHEMICAL
APPROACHES IN DESIGNING RELIABLE NONFRAGMENTING MDF
SYSTEMS, UTILIZING PYROTECHNIC DELAYS, ARE DISCUSSED.
OTHER MDF TOPICS DISCUSSED INCLUDE TRANSITION
FROM DETONATION TO DEFLAGRATION, DELAYS, AND IGNITION
THROUGH METAL WEBS (OR THROUGH BULKHEAD IGNITION)
FROM ONE HERMETICALLY SEALED MDF SYSTEM TO ANOTHER
HERMETICALLY SEALED MDF SYSTEM WHICH REQUIRES THE
USE OF PYROTECHNIC DELAY MIXTURES. TERMINAL
BOOSTERS AND THEIR COMPONENTS ARE DISCUSSED. A NEW
METHOD FOR THE LABORATORY SIMULATION OF GUN BARREL
TRACER FUNCTIONING IS PRESENTED. SEVERAL METHODS
OF DELIVERING AN IMPACT HAVE BEEN INVESTIGATED.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-626 170

1971

FELTMAN RESEARCH LABS PICATINNY ARSENALE DOVER N J

THE EFFECTS OF PROCESSING ON PYROTECHNIC
COMPOSITIONS. PART III: DIMENSIONAL EFFECTS OF
PAPER CASES ON ILLUMINANCE AND BURNING RATE OF FLARE
COMPOSITIONS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

JAN 66 27P

MIDDLEBROOKS, DORIS E. (KAYE,

SEYMOUR M. WEINGARTEN, GARY ;

REPT. NO. TR-3275

PROJ: DA-504-01-207

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FLARES, CONTAINERS), (*PYROTECHNICS,
PROCESSING), ILLUMINATION, BURNING RATE,
MAGNESIUM, SODIUM COMPOUNDS, NITRATES, VINYL
PLASTICS, PAPER, LIGHT, INTENSITY,
THICKNESS (U)

A STUDY WAS CONDUCTED TO EVALUATE THE EFFECTS OF
CHANGES IN THE DIMENSIONS OF THE PAPER CASES ON THE
BURNING RATE AND ILLUMINANCE CHARACTERISTICS OF
FLARES. MAGNESIUM/ SODIUM NITRATE/VINYL ALCOHOL
ACETATE RESIN FLARES OF COMPOSITIONS CONTAINING
MAGNESIUM OF THREE DIFFERENT MESH SIZES WERE BLENDED
AND LOADED INTO PAPER CASES HAVING TWO INTERNAL
DIAMETERS AND THREE WALL THICKNESSES. THE FLARES
WERE TESTED USING A PHOTOCELL-RECORDER COMBINATION
AND A LIGHT INTEGRATOR WHICH RECORDS LUMINOUS INTENSITY
AS A FUNCTION OF BURNING TIME. IN ADDITION, MOTION
PICTURES WERE TAKEN OF EACH TEST, AT 24 FRAMES PER
SECOND. THE LUMINOSITY AND PHOTOGRAPHIC RESULTS
REVEALED THAT THE PAPER CASES WERE SHIELDING THE
LIGHT RADIATION OF THE SMALL DIAMETER (0.62 INCH
ID) FLARES, THE THICK-WALLED ITEMS BEING AFFECTED
MORE THAN THE THIN. THIS OBSCURATION OF LIGHT WAS
SHOWN MORE SIGNIFICANTLY BY THE COARSE (30/50
MESH) MAGNESIUM SYSTEM. THE BURNING RATE DATA
FOR THE SMALL DIAMETER CASES AND BOTH THE ILLUMINANCE
AND BURNING RATE DATA FOR THE LARGE DIAMETER (1.33
INCH ID) CASES SHOWED NO VARIATION WHICH COULD BE
ATTRIBUTED TO THE DIFFERENCE IN CASE THICKNESS.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-627 257 21/2 19/1
NAVAL AMMUNITION DEPOT CRANE IND

IGNITION THEORY; APPLICATION TO THE DESIGN OF NEW
IGNITION SYSTEMS,

(U)

NOV 65 22P JOHNSON, DUANE M. I
REPT. NO. RDR-56
MONITOR: IDEP 415.00.00.00-X9-13

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, IGNITION), (*IGNITION,
PYROTECHNICS), (*SOLIDS, IGNITION), IGNITERS,
DESIGN, PHYSICAL PROPERTIES, CHEMICAL
PROPERTIES, THERMAL PROPERTIES, ENERGY, THEORY,
PARTIAL DIFFERENTIAL EQUATIONS

(U)

A THEORY IS PRESENTED ON THE IGNITION OF SOLID
COMPOSITIONS. THE EFFECT OF CERTAIN PHYSICAL,
CHEMICAL AND THERMAL PROPERTIES OF A SOLID
COMPOSITION ON THE IGNITION TIME AND IGNITION ENERGY
IS EXPLAINED AND SUPPORTED BY EXPERIMENTAL EVIDENCE.
DIFFERENT TYPES OF IGNITION SYSTEMS ARE DESCRIBED.
PROBLEM AREAS OF THE NORMAL IGNITION SYSTEMS ARE
DISCUSSED AND A TECHNIQUE TO OVERCOME THESE PROBLEM
AREAS IS OFFERED. BY USE OF THE DEVELOPED IGNITION
THEORY AND A HOT-BATH IMMERSION TEST APPARATUS, A
TECHNIQUE OF DETERMINING THE TRUE IGNITION
TEMPERATURE OF A COMPOSITION IS DESCRIBED.
(AUTHOR)

(U)

CO

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-627 649 19/1
NAVAL AMMUNITION DEPOT CRANE IND

PROPOSED KINETICS AND MECHANICS OF ILLUMINANT FLARES;
MAXIMIZING EFFICIENCY, (U)

JAN 66 46P JOHNSON, DUANE M. I
REPT. NO. RDTR-32
MONITOR: IDEP 415.00.00.00-X9-07

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FLARES, ILLUMINATION), DYNAMICS,
OPTIMIZATION, FLAMES, BURNING RATE, MAGNESIUM,
SODIUM COMPOUNDS, NITRATES, SPECTROSCOPY,
TEMPERATURE, REACTION KINETICS, BINDERS,
PHYSICAL PROPERTIES, OXIDIZERS (U)
IDENTIFIERS: EFFICIENCY, SODIUM NITRATE (U)

BY THE USE OF PHYSICAL MECHANISMS AND CHEMICAL KINETICS, PROPOSED TO BE REPRESENTATIVE OF PHENOMENA OCCURRING IN MAGNESIUM - SODIUM NITRATE - ORGANIC BINDER FLARE FLAMES, SEVERAL CHARACTERISTIC EFFECTS, OBSERVED IN CONNECTION WITH THE EFFICIENCY OF THIS TYPE OF FLAME, ARE EXPLAINED. A MEANS OF INVESTIGATING VARIOUS OXIDIZERS AND DEVELOPING NEW BINDERS IS PRESENTED AND VERIFICATION OF THE MEANS IS INDICATED. THE EFFECT OF FORMULATION CHANGES AND FLARE-DIAMETER ON THE SPECTRAL DISTRIBUTION OF THE FLARE EMISSIONS IS ILLUSTRATED AND THE PROBABLE CAUSE OF THE OBSERVED CHANGES IN SPECTRAL DISTRIBUTION IS GIVEN. THE DEFINITION OF THE OPTIMUM BURNING RATE IS GIVEN AND SUPPORTING REASONING, THROUGH PHYSICAL AND CHEMICAL MEANS, IS GIVEN FOR WHY AN OPTIMUM RATE EXISTS IN ILLUMINATION FLARE. THE DRASTIC REDUCTION IN THE EFFICIENCY OF A FLARE OPERATING AT HIGH ALTITUDES IS LIKEWISE EXPLAINED. THE VARIOUS EFFECTS OF SODIUM, BOTH OBSERVED AND PROPOSED, ARE DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-632 683 19/1
NAVAL AMMUNITION DEPOT CRANE IND

EXPERIMENTS IN DEVELOPING GREEN FLARE FORMULAS, (U)

SEP 59 22P ARMOUR, CARL ;
REPT. NO. RDTR-11,
MONITOR: IDEP 501.21.00.00-X9-02

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FLARES, MATERIALS), (*COLORED
FLARES, MATERIALS), COMBUSTION, TIME, FLAMES,
TEMPERATURE, COLORS, BORON, BARIUM COMPOUNDS,
NITRATES, POLYVINYL CHLORIDE (U)
IDENTIFIERS: BARIUM NITRATE (U)

EIGHTY GREEN FLARE PRODUCING FORMULAS WERE MIXED
AND TESTED FOR BURNING TIME AND QUALITY OF FLAME.
BURNING TEMPERATURES MEASURED ON TWELVE FORMULAS
CONTAINING BARIUM INDICATE THAT AN ENERGY LEVEL
ASSOCIATED WITH A TEMPERATURE RANGING FROM
APPROXIMATELY 1100C TO 1355C IS REQUIRED TO
PRODUCE A GREEN COLOR, WITH THE MORE INTENSE COLORS
BEING PRODUCED AT APPROXIMATELY 1300C. BELOW THE
ABOVE MINIMUM TEMPERATURE THE FLAMES WERE YELLOW,
ABOVE THE MAXIMUM THE COLORS APPROACHED WHITE LIGHT.
THE MOST PROMISING FORMULAS DEVELOPED CONSISTED OF
AN EFFICIENT THREE COMPONENT SYSTEM CONTAINING BORON,
BARIUM NITRATE AND POLYVINYL CHLORIDE. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-632 684 19/1 7/2
NAVAL AMMUNITION DEPOT CRANE IND

CHEMICAL ANALYSIS OF A TYPICAL PHOSPHORUS SMOKE AND
FLARE COMPOSITION, (U)

JUN 60 16P RIPLEY, WILLIAM I
REPT. NO. RDTR-16,
MONITOR: IDEP 501.21.00-00-X9-03

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SMOKE MUNITIONS, CHEMICAL ANALYSIS),
(*FLARES, CHEMICAL ANALYSIS), PHOSPHORUS, ZINC
COMPOUNDS, MANGANESE COMPOUNDS, MAGNESIUM,
VEGETABLE OILS, SOLVENT EXTRACTION, CHEMICAL
PRECIPITATION, QUANTITATIVE ANALYSIS (U)
IDENTIFIERS: LINSEED OIL, MANGANESE DIOXIDE, ZINC
OXIDE (U)

A SCHEME FOR THE CHEMICAL ANALYSIS OF A TYPICAL
PHOSPHORUS COMPOSITION OF ZNO, MG, MNO₂,
PHOSPHORUS, AND LINSEED OIL IS DESCRIBED IN DETAIL.
ZNO IS REMOVED BY CHROMIC ACID SOLUTION, MG BY
ACETIC ACID, AND THE RESULTING MIXTURE OF PHOSPHORUS,
MNO₂, AND LINSEED OIL IS BROUGHT INTO SOLUTION
WITH HN₃ AND H₂O₂. SILICA IS REMOVED AND
WEIGHED. MN IS PRECIPITATED OUT AS MNO₂ AND
IGNITED TO MN₃O₄, EDTA IS EMPLOYED TO CHELATE
IONS THAT MIGHT INTERFERE WITH THE PHOSPHORUS
DETERMINATION, AND THE PHOSPHATE PRECIPITATED OUT AS
THE PHOSPHOMOLYBDATE. LINSEED OIL IS ESTIMATED BY
DIFFERENCE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-634 655 20/5 19/1
FELTMAN RESEARCH LABS PICATINNY ARSENAL DOVER N J

CHEMICAL LASER PUMP, (U)

JUN 66 14P WRIGHT, JOHN L. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE ARMY SCIENCE CONFERENCE (1966), U. S. MILITARY ACADEMY, WEST POINT, N. Y., 14-17 JUNE 1966. COMPLETE PROCEEDINGS AVAILABLE IN TWO UNCLASSIFIED VOLUMES AS AD-634 615 AND AD-634 616 AND ONE CLASSIFIED VOLUME AVAILABLE TO QUALIFIED DDC USERS.

DESCRIPTORS: (*LASERS, PUMPING(OPTICAL)),
(*PUMPING(OPTICAL), CHEMICAL REACTIONS),
(*PYROTECHNICS, PUMPING(OPTICAL)), MIXTURES,
CYANOGEN, OXYGEN, ARGON, XENON, HELIUM,
METALS, DETONATIONS (U)

THE SHARPLY DEFINED BRIGHT ZONE PRODUCED BY THE DETONATION OF A CYANOGEN-OXYGEN MIXTURE IN SMALL TEST VEHICLES LOOKS PROMISING AS A PUMP FOR SOLID-STATE LASERS SUCH AS NEODYMIUM-DOPED GLASS AND RUBY. BRIGHTNESS TEMPERATURES BETWEEN 6000 TO 7000 K ARE ROUTINELY OBTAINED. BY ADDING INERT DEPANTS SUCH AS ARGON, XENON AND HELIUM TO THE MIXTURE, BRIGHTNESS TEMPERATURES IN THE VICINITY OF 8000K HAVE BEEN ATTAINED. THE COMBUSTION OR DETONATION THAT TAKES PLACE WITHIN THE TEST VEHICLE IS COMPLETELY CONTAINED, PRODUCES NO NOISE, AND CAN NON-DESTRUCTIVELY PUMP A LASER. EXTENSIVE EXPERIMENTATION WITH TEST VEHICLES TO CONTROL THE DETONATION WAVE HAS IMPROVED THE BRIGHTNESS AND DURATION OF THE SOURCE. A NEW FIXTURE HAS BEEN RECENTLY TESTED. THIS FIXTURE SOLVES THE OPTICAL COUPLING PROBLEM BY CREATING AN IMPLOSION WHICH RESULTS IN A BRIGHT DETONATION ZONE APPROACHING THE CENTER OF THE FIXTURE FROM TWO OPPOSITE DIRECTIONS. THE LASER ROD IS LOCATED AT THE CENTER OF THE FIXTURE AND RECEIVES THE PUMPING LIGHT FROM BOTH DIRECTIONS. PROBE MEASUREMENTS SHOW THE LIGHT PRODUCED IN THIS FIXTURE HAS A BRIGHTNESS TEMPERATURE IN EXCESS OF 7000K AND A DURATION IN EXCESS OF 200 MICROSECONDS. STRONG PUMPING OF A NEODYMIUM-GLASS LASER ROD WAS ACCOMPLISHED WITH THIS FIXTURE, AND HIGH ORDER LASING WAS OBSERVED. FUTURE PLANS WITH THIS FIXTURE WILL INCLUDE ATTEMPTS TO PUMP A RUBY LASER, MORE STRONGLY TO OBTAIN ABOVE THRESHOLD OUTPUTS. (AUTHOR)

84

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UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-634 925 15/3
HRB-SINGER INC STATE COLLEGE PA

POWS EVALUATION SURVEY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
OCT 65 132P LICASTRO, P. H. ;
REPT. NO. HRB-54100-F

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ALSO INCLUDES SUMMARY.

DESCRIPTORS: (*WARNING SYSTEMS, PYROTECHNICS),
(*CIVIL DEFENSE SYSTEMS, WARNING SYSTEMS), FLARES,
ROCKETS, SMOKES, SIGNALS, SMOKE GENERATORS,
PETN, SOUND SIGNALS, PARACHUTES, EFFECTIVENESS,
RURAL AREAS

(U)

A PYROTECHNIC OUTSIDE WARNING SYSTEM (POWS),
CONSISTING OF ROCKET PROPELLED VEHICLE, SOUND
PACKAGE, FLARE, SMOKE CLOUD AND PARACHUTE, WAS
EVALUATED AS AN ALERTING MEANS FOR REMOTE AREAS.
THE EVALUATION PROGRAM CONSISTED OF THREE PHASES.
IN THE PROCUREMENT/TECHNICAL EVALUATION PHASE TESTS
WERE CONDUCTED WITH THE INDIVIDUAL ALERTING
MECHANISMS, THEIR SEQUENCING AND THE PAYLOAD VEHICLE.
THE SURVEY PHASE INVOLVED ALL THE NECESSARY TASKS
FOR MEASURING THE SYSTEMS EFFECTIVENESS AS AN
ADMINISTERED BY FACE-TO-FACE INTERVIEWS. IN THE
ANALYSIS PHASE, A COMPUTER PROGRAM WAS DESIGNED TO
PROVIDE THE DESIRED DEVICE/MECHANISM EFFECTIVENESS OF
POWS AS A FUNCTION OF DISTANCE FROM THE TEST SITE.
THE RESULTS OF HRB-SINGER'S EVALUATION SHOW
THAT THE BASIC CONCEPT OF SUPPLEMENTARY OUTSIDE
WARNING THROUGH THE USE OF AN ACOUSTICAL SIGNAL FOR
GAINING POPULAR ATTENTION AND A VISUAL SIGNAL FOR
IDENTIFICATION IS VALID. POWS WITH ITS COMBINED
SONIC AND VISUAL INDICATORS COULD FUNCTION WITH A
REASONABLY HIGH DEGREE OF RELIABILITY FOR RANGES OF
TWO AND ONEHALF MILES IN RURAL ENVIRONMENTS AND TWO
MILES IN SUBURBAN ENVIRONMENTS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-636 165 19/7 21/8 19/1 21/2
NAVAL MISSILE CENTER POINT MUGU CALIF

SPECTRAL MONITORING OF ROCKET FLAMES. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.

JUL 66 17P KANE, E. M. ;
REPT. NO. TM-66-34,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*EXHAUST FLAMES, SPECTROSCOPY),
(*SPECTRUM ANALYZERS, EXHAUST FLAMES), (*ROCKETS,
EXHAUST FLAMES), (*PYROTECHNICS, SPECTROSCOPY),
ROCKET MOTORS, CAPTIVE TESTS, FLARES, MONITORS,
SPECTROGRAPHIC CAMERAS, DESIGN (U)

THREE TYPES OF SPECTROGRAPHS SUITABLE FOR ANALYSIS
OF ROCKET FLAMES ARE DESCRIBED: TOGETHER WITH TYPICAL
SPECTROGRAMS OF VARIOUS ROCKET AND PYROTECHNIC
FLAMES. THE USEFULNESS OF FLAME SPECTRA IN ROCKET
EVALUATION IS DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-637 512 19/1 21/2
DENVER RESEARCH INST COLO

PROCESSES OCCURRING IN PYROTECHNIC FLAMES.

(U)

DESCRIPTIVE NOTE: FINAL REPT. AUG 64-FEB 66.

APR 66 102P BLUNT, ROBERT M. ;
REPT. NO. 480-6604-F,
CONTRACT: N164-10520,
MONITOR: IDEP 415.00.00.00-X9-08

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PYROTECHNICS, *FLAMES), (*FLARES,
FLAMES), COLORS, ILLUMINATION, PRESSURE,
EXCITATION, BURNING RATE, TEMPERATURE, BARIUM
COMPOUNDS, HYDROXIDES, EQUATIONS,
SPECTRA (VISIBLE + ULTRAVIOLET)

(U)

THE RESEARCH WAS TO ACQUIRE INFORMATION THAT COULD
BE USED TO IMPROVE THE LUMINOSITY AND COLOR OF
ILLUMINATING AND SIGNALLING PYROTECHNIC COMPOSITIONS
USED IN FLARE PRODUCTION. THE FOLLOWING
OBSERVATIONS AND CONCLUSIONS WERE MADE: (1) A
SHARP DEGRADATION OF LUMINOSITY OCCURS AT LOW
AMBIENT PRESSURES. (2) THE EXCITATION PURITY
(COLOR) WAS OBSERVED TO INCREASE AS THE PRESSURE
DECREASED. (3) THE TIME REQUIRED TO BURN A 10
GRAM MASS WAS FOUND TO INCREASE AS THE AMBIENT
PRESSURE DECREASED. (4) THE TEMPERATURE
MEASUREMENTS ARE IN AGREEMENT WITH THE LUMINOSITY
FINDINGS, I.E., TEMPERATURE DECREASES WITH DECREASING
PRESSURE. (5) A TEST CONFIRMED THE HYPOTHESIS
THAT THE BAOH MOLECULE IS THE SOURCE OF THE GREEN
COLOR IN BA-CONTAINING FLARES. (6) THE CHANGES
IN LUMINOSITY AND BURNING RATE WERE EXPLAINED BY AN
HYPOTHESIS RELATING REACTION RATE TO PRESSURE OF
AMBIENT ATMOSPHERE. (7) THE OBSERVED BURNING
RATES AND LUMINOSITY WERE EXPRESSED IN MATHEMATICAL
FORM WHICH MAY BE HELPFUL IN FUTURE DESIGN STUDIES.
(8) A PHOTOGRAPHIC ATLAS OF SPECTRA OF FLARES
CONTAINING BARIUM AND SODIUM WAS ASSEMBLED COVERING
THE 3,700A TO 7,400A REGION.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-637 790 19/1
PICATINNY ARSENAL DOVER N J PYROTECHNICS LAB

DEVELOPMENT OF BURNING-TYPE COLORED SMOKES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.
AUG 66 SOP CRANE, EVERETT D. IWERBEL,
BURTON ; WEINGARTEN, GARRY ;
PROJ: DA-1X141806D136
TASK: 1X141806D13610
MONITOR: PA TR-3273

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SMOKE MUNITIONS, ROCKETS), (*COLORED
SMOKES, SMOKE MUNITIONS), SURFACE, MARKERS,
AIRCRAFT AMMUNITION, PYROTECHNICS, FUELS, DYES,
OXIDIZERS, BURNING RATE (U)

FIVE DIFFERENT COLORED SMOKE COMPOSITIONS WITH 2-
TO 3-INCH-PER-MINUTE BURNING RATES WERE DEVELOPED AND
TESTED FOR THE 2.75-INCH LOW-SPIN FOLDING FIN
AIRCRAFT ROCKET (LSFFAR). ACCEPTABLE COLORS AND
VOLUMES WERE OBTAINED. THE COMPOSITIONS DEVELOPED
WERE SR-207 (RED), SY-211 (YELLOW), SG-172
(GREEN), SV-16 (VIOLET), AND SB-9
(BLUE), EACH CONTAINING APPROPRIATE DYES COMBINED
WITH VARIOUS PROPORTIONS OF POTASSIUM CHLORATE,
SUGAR, AND VINYL ALCOHOL ACETATE RESIN (VAAR).
INCREASING THE LOADING PRESSURE FROM 9,000 TO 45,000
PSI DECREASED THE BURNING RATE BY 10-12% AND
REDUCED THE VOLUME BY 20% WITHOUT IGNITION OR OTHER
DIFFICULTIES. IN THE POTASSIUM CHLORATE/SUGAR
BINARIES STUDIED (40/52 THROUGH 75/25), THE
BURNING RATE INCREASED WITH INCREASING OXIDANT.
REPLACING SMALL PORTIONS OF THE SUGAR WITH SODIUM
BICARBONATE OR VAAR SLOWED THE BURNING RATE, WHILE
1-METHYLAMINOANTHRAQUINONE GAVE HIGHER BURNING RATES.
REPLACING SMALL PORTIONS OF THE DYE WITH SODIUM
BICARBONATE OR VAAR LOWERED THE BURNING RATES,
WHILE SUGAR OR SULFUR INCREASED THE BURNING RATES.
VARIOUS METHODS FOR STANDARDIZING THE TESTS WERE
INVESTIGATED AND APPLIED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-638 132 19/1
FELTMAN RESEARCH LABS PICATINNY ARSENAL DOVER N J

COMPARISON OF MECHANICALLY BALLED MAGNESIUM WITH
ATOMIZED MAGNESIUM FOR USE IN PYROTECHNIC
COMPOSITIONS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.
SEP 66 52P CARRAZZA, JAMES A. , JR. ;
MIDDLEBROOKS , DORIS E. ; KAYE, SEYMOUR M. ;
REPT. NO. PA-TR-3364
PROJ: DA-504-01-207,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PYROTECHNICS, *MAGNESIUM), (*FLARES,
MAGNESIUM), POWDER METALS, PARTICLES, STABILITY,
BRIGHTNESS, BURNING RATE, THERMOCHEMISTRY, HEAT
OF COMBUSTION, STORAGE (U)

RESULTS OF A VARIETY OF PHYSICAL AND CHEMICAL TESTS
INDICATE THAT, WITH A FEW MINOR EXCEPTIONS, BALLED
MAGNESIUM MEETS THE REQUIREMENTS OF MILITARY
SPECIFICATION 14067-A FOR 30/50 MESH MAGNESIUM
POWDER. THE BALLED MAGNESIUM WAS FOUND TO BE LESS
REACTIVE THAN THE CURRENTLY PRESCRIBED ATOMIZED
MAGNESIUM, BOTH WITH WATER AND AS A RESULT OF
EXPOSURE TO HIGH RELATIVE HUMIDITIES, AS DETERMINED
BY GAS EVOLUTION, WEIGHT GAIN, AND SURFACE AREA
MEASUREMENTS. RESULTS OF VACUUM STABILITY TESTS AT
167F AND 230F FOR THIRTY DAYS INDICATE THAT THE
BALLED MAGNESIUM HAS GREATER STABILITY THAN ATO
MAGNESIUM; THE THERMOCHEMICAL AND SENSITIVITY D.
FOR BALLED MAGNESIUM AND ATOMIZED MAGNESIUM ARE
COMPARABLE. IN PERFORMANCE CHARACTERISTICS SUCH AS
CANDLEPOWER, BURNING RATE, AND LUMINOUS EFFICIENCY,
SIMILAR RESULTS WERE OBTAINED WITH THE TWO MATERIALS.
THESE RESULTS INDICATE THAT THE READE BALLED
MAGNESIUM CAN BE USED AS AN ALTERNATE FOR ATOMIZED
30/50 MESH MAGNESIUM IN CONSOLIDATED PYROTECHNIC
COMPOSITIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-638 490 1971
NAVAL AMMUNITION DEPOT CRANE IND

EXPERIMENTAL HIGH INTENSITY FLARE SYSTEMS: DESIGN AND
TESTS OF. (U)

AUG 66 119P WILDLIDGE, JOHN E. I
REPT. NO. RDTR-75,
MONITOR: IDEP 415.00.00.00-X9-09

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FLARES, INTENSITY), (*PARACHUTE
FLARES, INTENSITY), FLIGHT TESTING, CAPTIVE TESTS,
BURNING RATE, ILLUMINATION, DESIGN (U)

FLIGHT AND STATIC TEST RESULTS ARE PRESENTED OF
VARIOUS CONFIGURED PARACHUTE SUSPENDED FLARE SYSTEMS.
IT WAS SHOWN THAT A FIVE-MILLION CANDLEPOWER, FIVE-
MINUTE BURNING TIME FLARE CAN BE ACHIEVED BY
UTILIZING MULTIPLE FLARES IN THE VERTICAL OR THE
HORIZONTAL ATTITUDE. IT IS ALSO SHOWN THAT
MULTIPLE PARACHUTES CAN BE UTILIZED TO OBTAIN A LOW
RATE OF DESCENT ALTHOUGH THERE APPEARS TO BE A LOSS
IN EFFICIENCY AS THE NUMBER OF PARACHUTES IS
INCREASED. ACTUAL PHOTOMETRIC DATA TAKEN DURING
FLIGHT TESTS IS PRESENTED FOR VARIOUS CONFIGURED
ILLUMINATING FLARE SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-640 812 1971
FRANKFORD ARSENAL PHILADELPHIA PA AMMUNITION DEVELOPMENT
AND ENGINEERING LABS

PRE-MISSION PREPARATION OF FLARE, AIRCRAFT,
PARACHUTE, MK 24, ALL MODS WITH SAFETY LANYARD
RETROFIT.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
SEP 66 28P GRANDY, A. J. ;
PROJ: DA-11660242,
MONITOR: FA TN-1116

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PARACHUTE FLARES, PREPARATION),
(*AIRCRAFT FLARES, PREPARATION), SAFETY, ARMING
DEVICES, LAUNCHING

(U)

A FIELD METHOD IS DESCRIBED FOR RETROFITTING
EXISTING MK 24 FLARES WITH A 50-FOOT SAFETY LANYARD
IN ORDER TO INCREASE FUZE ARMING DISTANCE WHEN THE
FLARES ARE MANUALLY LAUNCHED FROM THE INTERIOR OF
FIXED OR ROTARY WING AIRCRAFT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-641 893 1971
PICATINNY ARSENAL DOVER N J PYROTECHNICS LAB

STORAGE STABILITY OF PYROTECHNIC COMPOSITIONS
CONTAINING VINYL ALCOHOL ACETATE RESIN. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NOV 66 JUP CARRAZZA, JAMES A. IKAYE,
SEYMOUR M. I
PROJ: DA-504-01-207
MONITOR: PA TR-3357

UNCLASSIFIED REPORT

DESCRIPTORS: (PYROTECHNICS, STORAGE), (BINDERS,
PYROTECHNICS), (VINYL PLASTICS, BINDERS),
STABILITY, THERMAL STABILITY, THERMOCHEMISTRY,
IGNITION, DEGRADATION, BRIGHTNESS, BURNING RATE,
POLYVINYL ALCOHOL, ACETATES (U)

LONG TERM STORAGE SURVEILLANCE WAS CONDUCTED ON
PYROTECHNIC COMPOSITIONS EMPLOYING VINYL ALCOHOL
ACETATE RESIN (VAAR) AS A BINDER. THE STORAGE
STABILITY OF THE COMPOSITION AFTER IT HAD BEEN
EXPOSED TO AMBIENT AND HIGH TEMPERATURE (167F)
STORAGE CONDITIONS WAS DETERMINED. WEIGHT LOSSES
OCCURRED WHEN PYROTECHNIC INGREDIENTS AND
COMPOSITIONS CONTAINING VAAR WERE CONDITIONED AT
167F; HOWEVER, THESE WEIGHT LOSSES WERE TOLERABLE
WITH NOMINAL (4-6%) VAAR CONCENTRATIONS.
THERMOCHEMICAL ANALYSIS REVEALED THAT THE PRESENCE
OF VAAR LOWERS THE IGNITION AND THE DEGRADATION
TEMPERATURE OF PYROTECHNIC INGREDIENTS AND
COMPOSITIONS. IN ALL CASES, HOWEVER, THESE
TEMPERATURES REMAINED ABOVE ANY TEMPERATURE LIKELY TO
BE ENCOUNTERED IN ACTUAL STORAGE. THE ILLUMINANCE
AND BURNING RATE CHARACTERISTICS OF TYPICAL YELLOW,
RED, AND GREEN CONSOLIDATED SYSTEMS CONTAINING VAAR
DID NOT SHOW ANY CHANGES AS A RESULT OF A ONE-YEAR
SURVEILLANCE PERIOD AT BOTH AMBIENT AND HIGH
(167F) TEMPERATURES. IT WAS CONCLUDED THAT
VAAR CAN BE USED AS AN ALTERNATE FOR LAMINAC AS A
BINDER IN CONSOLIDATED PYROTECHNIC COMPOSITIONS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-641 957

1971

FELTHAM RESEARCH LABS PICATINNY ARSENAL DOVER N J

NEW FLARE FORMULATIONS FOR HIGH ALTITUDE APPLICATION,
(U)

OCT 66 24P CARRAZZA, JAMES A. ; JACKSON,
BOSSIE ; KAYE, SEYMOUR M. ;
PROJ: DA-504-01-027
MONITOR: PA TR-3360

UNCLASSIFIED REPORT

DESCRIPTORS: (FLARES, HIGH ALTITUDE), INTENSITY,
ILLUMINATION, BURNING RATE, MAGNESIUM,
ZIRCONIUM, HAFNIUM, MAGNESIUM ALLOYS, BARIUM
ALLOYS, STRONTIUM COMPOUNDS, SODIUM COMPOUNDS,
NITRATES, OXIDIZERS, SENSITIVITY, TESTS (U)

A COMPARISON OF VARIOUS FUELS, SUCH AS ATOMIZED
MAGNESIUM, ZIRCONIUM, HAFNIUM, MAGNESIUM-BARIUM
ALLOY, AND MAGNESIUM-STRONTIUM ALLOY, UNDER AMBIENT
AND SIMULATED HIGH ALTITUDE CONDITIONS HAS BEEN
CONDUCTED. THE METAL POWDERS WERE EVALUATED IN
BINARY FORMULATIONS USING SODIUM NITRATE OXIDANT.
KRAFT PAPER TUBES HAVING A 0.625 INCH ID AND
0.0625 INCH WALL THICKNESS WERE USED AS TEST
VEHICLES. DATA ANALYSES INDICATED THAT ALL THE
FORMULATIONS CONTAINING THE VARIOUS FUELS SUSTAINED
SIGNIFICANT DECREASES IN CANDLEPOWER AND BURNING RATE
IN THE TRANSITION FROM AMBIENT PRESSURE TO REDUCED
PRESSURE SIMULATING VARIOUS ALTITUDE LEVELS. ONLY
THE FORMULATIONS CONTAINING ZIRCONIUM AND HAFNIUM
WERE TESTED AT A SIMULATED ALTITUDE OF 100,000 FEET.
THE DATA OBTAINED FOR THE ALLOY-CONTAINING
COMPOSITIONS AT 80,000 FEET DID NOT JUSTIFY FURTHER
EVALUATIONS AT 100,000 FEET SIMULATED ALTITUDE. AT
SIMULATED ALTITUDES OF 80,000 FEET AND LOWER, THE
POWDERED ZIRCONIUM AND SOME OF THE ALLOY-CONTAINING
SYSTEMS WERE OBSERVED TO BE SUPERIOR TO THOSE
FORMULATIONS CONTAINING ATOMIZED MAGNESIUM. THE
SYSTEMS WHICH CONTAINED MAGNESIUM-BARIUM ALLOY WERE
FOUND TO BE SUPERIOR TO THE MAGNESIUM-STRONTIUM AND
THE MIXED ALLOY FORMULATIONS UNDER REDUCED PRESSURE
CONDITIONS. THE DATA GENERATED FOR THE HAFNIUM/
SODIUM NITRATE FORMULATION AT SIMULATED ALTITUDES OF
80,000- AND 100,000 FEET WAS NOT CONSIDERED RELIABLE
SINCE THE LIGHT OUTPUT WAS BELOW THE SENSITIVITY OF
THE INSTRUMENTATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-644 612 19/1 11/9
NAVAL AMMUNITION DEPOT CRANE IND

BINDING PROPERTIES AND OTHER CHARACTERISTICS OF
SEVERAL POLYESTER RESIN BINDERS USED IN PYROTECHNIC
FORMULATIONS. (U)

OCT 66 36P HAAS, DAVEY I
REPT. NO. NAD-CR-RDTR-51

UNCLASSIFIED REPORT

DESCRIPTORS: (•PYROTECHNICS, BINDERS), (•FLARES,
BINDERS), (•BINDERS, •POLYESTER PLASTICS),
TENSILE PROPERTIES, SHEAR STRESSES, BURNING RATE,
INTENSITY, POLYMERIZATION, AGING(MATERIALS),
TEMPERATURE (U)

THE BINDING STRENGTHS OF PELLETS SUBJECTED TO
TENSILE AND SHEAR STRESSES, AND THE BURNING TIME AND
CANDLEPOWER OF FLARES PRESSED FROM COMPOUND AGED 0-6
HOURS IN INCREMENTS OF ONE HOUR PRIOR TO PRESSING
WERE DETERMINED AFTER CURING PERIODS OF 5 AND 30
DAYS. THREE FORMULATIONS WERE USED, EACH
CONTAINING THE SAME RATIO OF MAGNESIUM/SODIUM
NITRATE/BINDER BUT, WITH THREE DIFFERENT POLYESTER
RESIN BINDERS. THE VARIATIONS IN PHYSICAL STRENGTH,
CANDLEPOWER, AND BURNING TIME WITH RESPECT TO DELAY
TIME BETWEEN MIXING AND PRESSING WERE FOUND TO BE
GREATEST FOR PELLETS AND CANDLES CONTAINING LAMINAC
4110. LIKEWISE, THE PHYSICAL STRENGTH OF PELLETS
CONTAINING LAMINAC 4110 WAS SIGNIFICANTLY HIGHER
THAN THE OTHER PELLETS AFTER CURING 5 DAYS; HOWEVER,
TESTS AFTER 30 DAYS INDICATED THAT BY THIS TIME THE
LAMINAC 4110 HAD ESSENTIALLY FULLY CURED, AND NOW
HAD BINDING PROPERTIES SIMILAR TO LAMINAC 4110.
ALL UNITS CURED FOR 16 HOURS AT 150F, AND THEN
TESTED AFTER 5 DAYS EXHIBITED CONSIDERABLY HIGHER
STRENGTHS THAN PELLETS NOT SUBJECTED TO AN ELEVATED
TEMPERATURE. HOWEVER, TESTS AFTER 30 DAYS SHOWED
THAT FOR THE LAMINAC BINDERS, GREATER BINDING
STRENGTH IS OBTAINED BY CURING AT ROOM TEMPERATURE
FOR THE DURATION OF THE CURING CYCLE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-645 702 19/6 19/1
PICATINNY ARSENAL DOVER N J FELTHAM RESEARCH LABS

DEVELOPMENT OF A SAFE EXPELLING SYSTEM FOR THE M8
PRACTICE ANTIPERSONNEL MINE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
DEC 66 28P CRANE, EVERETT D. IWERBEL,
BURTON WEINGARTEN, GARY I
PROJ: DA-1C543312D414
MONITOR: PA TR-3392

UNCLASSIFIED REPORT

DESCRIPTORS: (•MINES(ORDNANCE), TRAINING
AMMUNITION), (•PYROTECHNIC PROJECTORS, •TRAINING
AMMUNITION), SMOKES, PYROTECHNICS (U)
IDENTIFIERS: M8 MINE (U)

SEVERAL POSSIBLE NEW EXPELLING SYSTEMS FOR THE M8
PRACTICE ANTIPERSONNEL MINE WERE INVESTIGATED. THE
BEST RESULTS WERE OBTAINED WITH A SYSTEM WHICH
CONTAINED 0.7 GRAM OF A SMOKE COMPOSITION CONSISTING
OF 40% 1-METHYLAMINOANTHRAQUINONE, 40% POTASSIUM
CHLORATE, AND 20% SUCROSE IN THE BASE OF THE TUBE
AND 0.2 GRAM OF A-4 BLACK POWDER ADJACENT TO THE
FUZE. THE VOLUME AND PERCEPTIBILITY OF THE SMOKE
WERE SUPERIOR TO THAT OBSERVED WITH THE STANDARD
BLACK POWDER CHARGE WHILE NO FLAME WAS VISIBLE. THE
SOUND PRODUCED AND THE HEIGHT TO WHICH THE PLUG WAS
EJECTED WERE EQUAL TO THAT OF THE STANDARD. ROUNDS
CONTAINING THE ABOVE CHARGES WERE STORED AT -40F
AND 165F AND FIRED SUCCESSFULLY AT THE SAME
TEMPERATURES. WHEN A YELLOW SMOKE COMPOSITION WAS
USED IN CONJUNCTION WITH BLACK POWDER, IT WAS ALSO
FOUND TO EXPEL THE PLUG WITH NO ACCOMPANYING FLAME.
BECAUSE IT WAS DECIDED, HOWEVER, THAT A RED SMOKE
WOULD BE MORE PERCEPTIBLE THAN THE YELLOW, THE YELLOW
COMPOSITION WAS NOT RECOMMENDED. PHYSICOCHEMICAL
DATA WAS CALCULATED FOR THE COMPOSITIONS
INVESTIGATED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-645 763 19/1
PICATINNY ARSENAL DOVER N J PYROTECHNICS LAB

EVALUATION OF NEW PHOTOFLASH FORMULATIONS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JAN 67 36P EDELMAN, DAVID J. ; KAYE,
SYMOUR M. ; JACKSON, BOSSIE ;
PROJ: DA-504-01-207
MONITOR: PA TR-3382

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, MATERIALS),
(*PHOTOFLASH AMMUNITION, MATERIALS), (*HAFNIUM,
PYROTECHNICS), OXIDIZERS, POTASSIUM COMPOUNDS,
PERCHLORATES, BARIUM COMPOUNDS, NITRATES,
ILLUMINATION, EFFICIENCY, ALTITUDE, INTENSITY,
PHOTOFLASH CARTRIDGES (U)
IDENTIFIERS: POTASSIUM PERCHLORATE, BARIUM
NITRATE (U)

PHOTOFLASH SYSEMS CONTAINING HAFNIUM AND POTASSIUM
PERCHLORATE IN STOICHIOMETRIC (72/28), FUEL RICH
(77/23, 82/18), AND CALCULATED MAXIMUM EFFICIENCY
(87/13) PROPORTIONS GENERALLY EXHIBIT GREATER
LUMINOUS EFFICIENCY ON A VOLUME BASIS
(CANDLESECONDS PER CUBIC CENTIMETER) THEN THE
CONVENTIONAL 60/40 POTASSIUM PERCHLORATE/ALUMINUM AND
TYPE 3, CLASS A PHOTOFLASH FORMULATIONS UNDER
EITHER AMBIENT CONDITIONS OR REDUCED PRESSURE
CONDITIONS SIMULATING AN 80,000-FOOT ALTITUDE.
WITH INCREASED HAFNIUM CONTENT, GREATER INTEGRAL
LIGHT AND VOLUMETRIC EFFICIENCY VALUES ARE OBTAINED
UNDER EITHER AMBIENT OR HIGH ALTITUDE CONDITIONS.
UNDER REDUCED PRESSURE CONDITIONS, THE
STOICHIOMETRIC HAFNIUM/POTASSIUM PERCHLORATE SYSTEM
AND A TERNARY BLEND OF HAFNIUM/POTASSIUM PERCHLORATE/
BARIUM NITRATE (72/14/14) GAVE SUPERIOR PEAK
LIGHT INTENSITY VALUES WHEN COMPARED WITH THE ABOVE
CONVENTIONAL FORMULATIONS AS WELL AS THE OPTIMUM HIGH
ALTITUDE FLASH SYSTEM OF 80/20 CALCIUM/POTASSIUM
PERCHLORATE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-652 822 19/1 20/6 20/13
DENVER RESEARCH INST COLO

BLACK BODY FUNCTIONS FOR PYROTECHNICISTS, (U)

MAR 67 193P BLUNT, R. M. ;
REPT. NO. DR1-880-67(13-F-APP
CONTRACT: N164-11171
MONITOR: NAD-CR, IDEP R0TR-90,347.00.00.00-X9-03

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, BLACKBODY RADIATION),
(*BLACKBODY RADIATION, TABLES), THERMODYNAMICS,
SURFACE TEMPERATURES, BRIGHTNESS, POWER SPECTRA,
STATISTICAL FUNCTIONS, GRAPHICS (U)

PLANCK'S BLACK BODY DATA IS TABULATED. THE DATA
IS PRESENTED FROM 0.35 MICRONS TO 12.0 MICRONS IN
INCREMENTS OF 0.005 MICRONS AND AT TEMPERATURES FROM
1500K THROUGH 4050K IN 50K INCREMENTS.
HEMISPHERICAL POWER, POWER NORMALIZED TO PEAK,
SPECTRAL BRIGHTNESS, TEMPERATURE EXPONENT N, AND
CUMULATIVE AND PERCENTAGE OF POWER BETWEEN ZERO AND
THE LISTED WAVELENGTH. IN ADDITION, GRAPHS OF THE
TEMPERATURE EXPONENT VS TEMPERATURE AND VS WAVELENGTH
ARE INCLUDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-655 820 19/1 21/2
DENVER RESEARCH INST COLO

EVALUATION OF PROCESSES OCCURRING IN PYROTECHNIC
FLAMES.

(U)

DESCRIPTIVE NOTE: FINAL PROGRESS REPT. FEB 66-FEB 67,
MAR 67 84P BLUNT, ROBERT M. I
REPT. NO. DR1-880-6703-F
CONTRACT: N164-11171
MONITOR: IDEP 415.00.00.00-X9-11

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, SPECTRA(VISIBLE +
ULTRAVIOLET)), (*FLAMES, PYROTECHNICS), FUELS,
MAGNESIUM, CALCIUM, CONTINUOUS SPECTRUM, SODIUM,
FLARES, SODIUM COMPOUNDS, CALCIUM COMPOUNDS,
NITRATES

(U)

IDENTIFIERS: CALCIUM NITRATE, SODIUM NITRATE

(U)

SPECTROSCOPIC STUDIES OF THE RADIATION EMITTED IN
THE VISIBLE REGION BY PYROTECHNIC COMPOSITIONS
CONTAINING MAGNESIUM AND CALCIUM AS FUELS WERE MADE.
THE SPECIES PRESENT WERE IDENTIFIED AND DATA ON THE
DOMINANT WAVELENGTH AND PURITY OF THE RADIATION FROM
THE FLAMES ARE PRESENTED. SPECTROSCOPIC TECHNIQUES
WHICH WERE USED TO DETERMINE THE FLAME TEMPERATURES
DID NOT PRODUCE USEFUL RESULTS. THE REASON FOR THE
SODIUM CONTINUUM IS DISCUSSED AND IT IS COMPARED TO
THE CONTINUUM FOUND IN THE RADIATION FROM HIGH
PRESSURE MERCURY DISCHARGE TUBES. A RESUME OF THE
IMPORTANT PAPERS PUBLISHED SINCE ABOUT 1900 ON SODIUM
SPECTRA IS GIVEN. A BIBLIOGRAPHY OF THESE PAPERS
IS PROVIDED. THE CHANGE IN THE INTENSITY OF THE
VISIBLE RADIATION FROM MAGNESIUM-SODIUM NITRATE
FLARES IS COMPARED WITH THE CHANGE FOR CALCIUM-
CALCIUM NITRATE AND MAGNESIUM-CALCIUM NITRATE AS THE
AMBIENT PRESSURE IS REDUCED. IT WAS NOTED THAT
ANHYDROUS CALCIUM NITRATE CAN BE MIXED WITH CALCIUM
METAL AND PRESSED INTO FLARE CANDLES, BUT THE
HYDRATED NITRATE CANNOT BE USED SATISFACTORILY. A
RED SHIFT IN DOMINANT WAVELENGTH WHICH IS ASSOCIATED
WITH INCREASED MAGNESIUM CONTENT WAS NOTED AND
PARTIALLY EXPLAINED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-661 449 1971
NAVAL AMMUNITION DEPOT CRANE IND

REDESIGN OF MK 33 MOD 0 FLARE HEAD,

(U)

SEP 67 42P SCOTT, PAUL E. I
REPT. NO. NAD-CR-RUTR-97

UNCLASSIFIED REPORT

DESCRIPTORS: (ROCKET FLARES, DESIGN), (ROCKET
HEADS, DESIGN), RELIABILITY

(U)

IDENTIFIERS: MARK-33 ROCKET HEAD (5-IN.),
ZUNI

(J)

THE REPORT DESCRIBES THE REDESIGN EFFORT ON THE
MK 33 MOD 0 FLARE HEAD FOR THE 5 IN. MK 16
ROCKET MOTOR. THE WORK WAS DIRECTED TOWARD
REDUCTION OF THE CHARACTERISTIC FAILURES SUCH AS
NONIGNITION, SHORT FLARE DURATION, SUSPENSION
FAILURE, LOSS OF FLARE COMPOSITION DURING AND AFTER
DEPLOYMENT. THE REDUCTION IN FAILURE RATE WAS FROM
APPROXIMATELY 70% TO LESS THAN 10%. MUCH OF
THE EXISTING MOD 0 HARDWARE WAS UTILIZED.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-663 100 1971
THIOLKOL CHEMICAL CORP. BRIGHAM CITY UTAH WASATCH DIV

ADVANCED CASTABLE FLARE ILLUMINANT. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
AUG 67 SIP MCDERMOTT, JOHN M. ;
CONTRACT: N00164-67-C-0359
MONITOR: NAD-CR RUTH-99

UNCLASSIFIED REPORT

DESCRIPTORS: (•FLARES, MATERIALS), MATERIAL
FORMING, CASTING, BINDERS, EPOXY PLASTICS,
POLYESTER PLASTICS, FUELS, MAGNESIUM, OXIDIZERS,
SODIUM COMPOUNDS, NITRATES,
PERFORMANCE (ENGINEERING), ENVIRONMENTAL
TESTS (U)
IDENTIFIERS: MARK-24 FLARES (U)

A FEASIBILITY STUDY FOR THE CASTING OF A 4.6 INCH
DIAMETER ILLUMINATING FLARE IS REPORTED. A LIMITED
EVALUATION OF THE FLARES IS CONDUCTED. THE FLARES
ARE CAST WITH A POLYESTER-EPOXY BINDER SYSTEM AND
UTILIZE MAGNESIUM AS A FUEL AND SODIUM NITRATE AS THE
OXIDANT. A LINER SYSTEM BETWEEN THE COMPOSITION
AND THE ALUMINUM CANDLE CASE IS DESCRIBED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOHOB

AD-664 967 19/1
FRANKFORD ARSENAL PHILADELPHIA PA PITHAN-DUNN RESEARCH
LABS

SMALLER, FASTER, BRIGHTER, (U)

AUG 67 BP CAVELL, WINSTON W. PERKINS;
WILLIAM E. CAVEN, JAMES J. I
MONITOR; FA A67-15

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN ORDNANCE P1-2 JUL-
AUG 1967.

DESCRIPTORS: (•)TRACERS(ORDNANCE), SMALL ARMS),
(•)PYROVECHNICS, TRACERS(ORDNANCE)), ZIRCONIUM,
POTASSIUM COMPOUNDS, CHLORATES, OXIDIZERS,
REACTION KINETICS, ADDITIVES, SOLUTIONS,
ACETATES, VINYL PLASTICS, BRIGHTNESS, BURNING
RATE, BINDERS (U)
IDENTIFIERS: POTASSIUM CHLORATE, POTASSIUM
PERCHLORATE (U)

TO OBSERVE TRAJECTORIES OF MINIATURE, HIGH-VELOCITY PROJECTILES FIRED AT NIGHT OR IN DAYLIGHT, TRACER COMPOSITIONS BURNING FASTER AND BRIGHTER THAN CONVENTIONAL TYPES HAD TO BE DEVELOPED. NUMEROUS COMPOSITIONS CONTAINING VAAR-ZR-KCLO3 (OR KCLO4) WERE EVALUATED WITH A FUEL-RICH COMBINATION BEING CHARGED INTO PROJECTILES HAVING 0.060 INCH DIAMETER CAVITIES BOTH AS PELLETS AND AS VISACORE (EXTRUDED METAL TUBES OF PYROTECHNIC COMPOSITIONS) TO OBTAIN SATISFACTORY PERFORMANCES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-669 435 4/2 7/4
NAVAL AMMUNITION DEPOT CRANE IND

A THEORETICAL TREATMENT OF MIXED SMOKES AS ICE
NUCLEI,

(U)

APR 68 35P JOHNSON, DUANE M. I
REPT. NO. NAD-CR-RDTR-112
MONITOR: IDEP 347.15.00.00-X9-01

UNCLASSIFIED REPORT

DESCRIPTORS: (ARTIFICIAL PRECIPITATION,
PYROTECHNICS), NUCLEATION, SMOKE GENERATORS,
SUPERCOOLING, BROWNIAN MOTION, CHEMICAL REACTIONS,
SALTS, POTASSIUM COMPOUNDS, SILVER COMPOUNDS,
IODIDES, ICE FOG

(U)

A PROPOSED NUCLEATION MECHANISM IS DESCRIBED FOR
MIXED SMOKES COMPOSED OF POTASSIUM IODIDE AND SILVER
IODIDE. THE DYNAMIC DISSOLUTION OF SUCH SMOKE
PARTICLES IS CONSIDERED TO BE THEORETICALLY OF
SIGNIFICANCE IN THE NUCLEATION MECHANISM OF
SUPERCOOLED FOGS OF WATER DROPLETS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-671 768 1971
NAVAL AMMUNITION DEPOT CRANE IND

A PRELIMINARY INVESTIGATION OF THE REACTIVITY OF LEAD
DIOXIDE. (U)

JUN 68 102P RIPLEY, WILLIAM L. LIPSCOMB,
CHARLES A. ;
REPT. NO. NAD-CR-RDTR-114
PROJ: A-35-532-022/323-1/F008 17-02
MONITOR: IDEP 501.73.90.00-X9-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, LEAD COMPOUNDS),
(*LEAD COMPOUNDS, REACTION KINETICS), DIOXIDES,
BURNING RATE, PARTICLE SIZE, THERMAL ANALYSIS,
CALORIMETRY, CHEMICAL ANALYSIS, DENSITY, X-RAY
DIFFRACTION ANALYSIS, X-RAY SPECTROSCOPY, FLARES,
IGNITION (U)
IDENTIFIERS: *LEAD(IV) OXIDE, PYROTECHNIC
STARTER COMPOSITIONS (U)

A STUDY IS MADE OF THE PERFORMANCE CHARACTERISTICS
OF LEAD DIOXIDE SPECIMENS FROM FIVE U. S.
MANUFACTURERS. REACTIVITY DATA IS OBTAINED USING
TEMPERATURE-TIME CURVES, PRESSURE-TIME CURVES, AND
BURNING RATE OF DELAY BODIES. THE RELATIONSHIP OF
CHEMICAL AND PHYSICAL PROPERTIES OF LEAD DIOXIDE TO
ITS PERFORMANCE IN THE VARIOUS TESTS, AND THE
RELATIONSHIP OF THE VARIOUS PERFORMANCE TESTS TO EACH
OTHER, ARE CONSIDERED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-671 827 19/1
DENVER RESEARCH INST COLO

STUDY OF GELLED ILLUMINANT COMPOSITIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 23 MAY 67-23 MAY 68,
MAY 68 4UP BLUNT, ROBERT M. ;
CONTRACT: N00164-67-C-0498
PROJ: A35532-022/383-1/F008 -17-U2
MONITOR: NAD-CR, IDEP RDTR-116,501.21.00.00-X9-
01

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *GELS), MARKERS,
FLARES, OXIDIZERS, PERCHLORATES, POTASSIUM
COMPOUNDS, SODIUM COMPOUNDS, BARIUM COMPOUNDS,
STRONTIUM COMPOUNDS, LITHIUM COMPOUNDS, FUELS,
ORGANIC SOLVENTS, ILLUMINATION, INTENSITY,
COLORS (U)

THE HIGH LUMINOUS INTENSITY AND COLOR PURITY
PRODUCED BY THE FLAMES RESULTING FROM THE COMBUSTION
OF GROUP II PERCHLORATES WITH ALCOHOL AND OTHER
ORGANIC SOLVENTS WAS NOTED IN A PREVIOUS STUDY OF AIR
AND WATER REACTIVE MATERIALS (1). THIS PRESENT
STUDY WAS TO INVESTIGATE THE FEASIBILITY OF USING
THESE MIXTURES IN MARKERS, FLARES AND SIMILAR DEVICES
OR UNITS THAT COULD BE DROPPED FROM AN AERIAL LANDING
UNIT. THE APPROACH TAKEN WAS THAT OF
CHARACTERIZING THE FLAME PRODUCED BY A TYPICAL,
OPERATIONAL DEVICE, WHICH WAS THE MARKER,
LOCATION, MARINE MK 2-0, DEPTH CHARGE,
NIGHT, IN TERMS OF SIZE AND CANDELA. THE
INTENTION WAS TO SHOW THE IMPROVEMENT RESULTING FROM
THE ADDITION OF PERCHLORATE-FUEL GELS TO THIS FLAME,
USING A PROTOTYPE OF A DEVICE THAT MIGHT BE ADDED TO
EXISTING MARKERS OF THIS TYPE. IT IS CONCLUDED
THAT A REDESIGN OF THE MARKER WOULD BE NECESSARY TO
TAKE ADVANTAGE OF THE PROPERTIES OF THIS PARTICULAR
GELLED OXIDIZER/FUEL COMBINATION. DATA ON GELLING
AGENTS, GROUP II PERCHLORATE SOLUBILITIES IN
VARIOUS ORGANIC LIQUIDS AND FLAME COLOR AND
CANDLEPOWER ARE REPORTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-672 344 19/1 21/2
NAVAL AMMUNITION DEPOT CRANE IND

INVESTIGATIONS INTO THE CALORIMETRIC DETERMINATION OF
THE HEAT OF COMBUSTION OF A TERTIARY PYROTECHNIC,

(U)

MAR 60 17P RIPLEY, WILLIAM I
REPT. NO. NAD-CR-RDTR-13

UNCLASSIFIED REPORT

DESCRIPTORS: (•PYROTECHNICS, HEAT OF COMBUSTION),
(•THERMITE, HEAT OF COMBUSTION), CALORIMETRY,
MAGNESIUM, BARIUM COMPOUNDS, PEROXIDES, BINDERS,
POLYESTER PLASTICS, AIR, OXYGEN, ARGON
IDENTIFIERS: BARIUM PEROXIDE

(U)

(U)

THE CALORIMETRIC DETERMINATION OF THE HEAT OF
COMBUSTION OF A TERTIARY PYROTECHNIC COMPOSITION -
THE THERMITE MIXTURE - WAS STUDIED. RESULTS WERE
OBTAINED UNDER THREE SETS OF CONDITIONS:
COMBUSTION OF THE THERMITE MIXTURE IN LIMITED AIR, IN
ARGON GAS, AND IN OXYGEN GAS AT A PRESSURE OF 20
ATMOSPHERES. PROCEDURES AND RESULTS ARE COMPARED
EACH WITH THE OTHERS, AND, WHEN POSSIBLE, WITH
THEORETICALLY PREDICTED VALUES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-673 081 1971
NAVAL AMMUNITION DEPOT CRANE IND

IMPROVED ILLUMINATING FLARE.

(U)

DESCRIPTIVE NOTE: RESEARCH AND DEVELOPMENT REPT.,
JUL 68 28P DOUDA, BERNARD E. ;
REPT. NO. NAD-CR-RDR-121
PROJ: A35-532-022/323-/F008-17-02
MONITOR: IDEP 415.00.00.00-X9-14

UNCLASSIFIED REPORT

DESCRIPTORS: (•FLARES, MATERIALS); ILLUMINATION,
MAGNESIUM, BINDERS, EPOXY PLASTICS, POLYESTER
PLASTICS, BURNING RATE, EFFICIENCY, PARACHUTE
FLARES

(U)

IDENTIFIERS: •ILLUMINATING FLARES

(U)

DATA ARE PRESENTED TO SHOW THAT A LESS EXPENSIVE
MAGNESIUM CAN BE USED TO MAKE AN ILLUMINATING FLARE
CANDLE WHICH GENERATES AT LEAST AS MUCH LIGHT AS
CONVENTIONAL COMPOSITIONS. THE COMPOSITION
UTILIZES AN IMPROVED BINDER. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-673 976 20/6 7/2 7/4
DENVER RESEARCH INST COLO MECHANICS DIV

STUDY OF SPECTRA OF METAL-OXIDANT COMBINATIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 67-MAR 68,
MAR 68 118P BLUNT, ROBERT M. ;
REPT. NO. DR1-3976-6803-F
CONTRACT: N00164-67-C-0320
PROJ: A35-532-022/323-1/F008-17-02
MONITOR: IDEP 415.00.00.00-X9-12

UNCLASSIFIED REPORT

DESCRIPTORS: (*SPECTRA(VISIBLE + ULTRAVIOLET),
ALKALI METAL COMPOUNDS), (*SPECTRUM ANALYZERS,
ALKALINE EARTH COMPOUNDS), (*PYROTECHNICS,
*ATOMIC SPECTROSCOPY), ABSORPTION SPECTRUM,
PERCHLORATES, SODIUM COMPOUNDS, POTASSIUM
COMPOUNDS, BARIUM COMPOUNDS, STRONTIUM COMPOUNDS,
LITHIUM COMPOUNDS, MAGNESIUM COMPOUNDS, ALUMINUM
COMPOUNDS, COMBUSTION, REAL TIME, TABLES,
INSTRUMENTATION, SIGNAL-TO-NOISE RATIO, CHEMICAL
ANALYSIS (U)

IDENTIFIERS: GRAPHS(CHARTS) (U)

THE TIME-INTEGRATED GRATING SPECTRA OBTAINED AT A
DISPERSION OF 14.8A NYSTROM UNITS PER MILLIMETER
FROM FLAMES PRODUCED BY MG-BA(NO3)2, MG-
NANO3, MG-BA(NO3)2 - SR(NO3)2-
YFE, AL-NACLO4-PVC, AL-KCLO4-PVC,
AL-SR(CLO4)2-PVC, B-BA(CLO4)1-
PVC, B-KCLO4-PVC, MG-LICLO4-PVC,
MG-NACLO4, AT DIFFERENT WEIGHT PERCENTAGES
ARE PHOTOGRAPHICALLY REPRODUCED. THE ABSORPTION OF
THE LIGHT RESULTING FROM ITS PASSAGE THROUGH THE
SMOKE EVOLVED DURING COMBUSTION HAS BEEN DETERMINED
AND ABSORPTION COEFFICIENTS TABULATED FOR THE SMOKE
FROM SEVERAL DIFFERENT COMPOSITIONS AND AMBIENT
PRESSURES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-675 503 19/1 20/6
MISSOURI RESEARCH LABS INC ST LOUIS

LUMINESCENT SMOKE GENERATION FEASIBILITY STUDY. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAY 68 29P NOWAKOWSKI, PAUL L. ;
CONTRACT: N61339-67-C-0095
TASK: 5709
MONITOR: NAVTRADEVCEH 67-C-0095-1

UNCLASSIFIED REPORT

DESCRIPTORS: (+SMOKES, LUMINESCENCE), (+FUELS,
SMOKE GENERATORS), PYROTECHNICS, ULTRAVIOLET
RADIATION, ILLUMINATION, FLUORESCENCE, EXPLOSIONS,
SIMULATION, FEASIBILITY STUDIES, COMPATIBILITY,
STATE-OF-THE-ART REVIEWS, CONFIGURATION, TEST
METHODS, TEST EQUIPMENT, CHEMICAL COMPOUNDS,
STABILITY (U)
IDENTIFIERS: SMOKE CLOUDS, X3H14 EXPLOSION (U)
SIMULATORS, FLUORANTHENES

THE SMOKE FUELS DESCRIBED IN THIS REPORT SERVE, IN
CONJUNCTION WITH THE X3H14 SMOKE GENERATOR, TO
ACCOMPLISH SMOKE CLOUDS WHICH ARE SENSITIVE TO
ULTRAVIOLET LIGHT EXCITATION; THAT IS, THE SMOKE
CLOUD IS LUMINESCENT WHEN EXPOSED TO GE BLB 40
W AND GE BL 40 W BULBS. THE SMOKE CLOUDS ARE
LUMINESCENT AND DISSIPATE CLEANLY AFTER A FEW
SECONDS. THIS REPORT COVERS THE PROGRAM OF
LITERATURE AND BENCH RESEARCH CONDUCTED IN
DEVELOPMENT OF THESE FORMULATIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-676 118 19/1
PICATINNY ARSENAL DOVER N J FELTHAM RESEARCH LABS

USE OF ORGANIC DYES IN WHITE SMOKE FORMULATIONS. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,
SEP 68 17P HANNO, RALPH ;
PROJ: DA-1-B-542703-D-339
TASK: 1-B-542703-D-33908
MONITOR: PA TM-1839

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, SMOKES), (*SMOKES,
*DYES), HALOGENATED HYDROCARBONS, QUINONES,
BURNING RATE, IGNITION, IMPACT SHOCK,
SENSITIVITY, POTASSIUM COMPOUNDS, CHLORIDES,
VINYL PLASTICS, SIGNALS, SMOKE GENERATORS (U)
IDENTIFIERS: SMOKE SIGNALS, CHLORO ANTHRAQUINONES,
TETRACHLORO ANTHRAQUINONES (U)

COMPOSITIONS CONTAINING POTASSIUM CHLORATE, SUGAR,
VINYL ALCOHOL ACETATE RESIN (VAAR), AND THE WHITE
DYES 2-CHLOROANTHRAQUINONE, AND 1,4,5,8-
TETRACHLOROANTHRAQUINONE WERE FOUND TO PRODUCE GOOD
QUALITY GRAY-WHITE SMOKE CLOUDS. WITH XM168
GROUND SIGNAL PARTS AS TEST VEHICLES, THE BURNING
TIME OF PRESSED PELLETS CONTAINING THESE DYES WAS
BETWEEN 16 AND 25 SECONDS. BURNING WAS SLIGHTLY
FASTER IF GRANULAR RATHER THAN POWDERED DYES WERE
USED. COMPOSITIONS CONTAINING 2-
CHLOROANTHRAQUINONE HAD AN IGNITION TEMPERATURE OF
135C, A TEMPERATURE LOWER THAN DESIRED FOR SAFE
MANUFACTURE. AN ATTEMPT TO BRING THE IGNITION
TEMPERATURE UP TO A SAFER RANGE BY COATING THE
INGREDIENTS WITH VAAR PRIOR TO THE ACTUAL BLENDING
OF THE COMPOSITION MET WITH LITTLE SUCCESS.
COMPOSITIONS CONTAINING 1,4,5,8-
TETRACHLOROANTHRAQUINONE HAD AN ACCEPTABLE IGNITION
TEMPERATURE OF 305C. THE IMPACT SENSITIVITY
VALUES WERE 8 INCHES FOR BOTH COMPOSITIONS. BOTH
WERE INSENSITIVE TO FRICTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-676 509 19/1
NAVAL AMMUNITION DEPOT CRANE IND

A PRELIMINARY INVESTIGATION INTO THE EFFECT OF
ADDITIVES ON THE PERFORMANCE OF FLARE COMPOSITIONS. (U)

SEP 68 23P HOWLETT, SYDNEY L. I
REPT. NO. NAD-CR-RDTR-128
MONITOR: IDEP 501.21.00.00-X9-05

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRCRAFT FLARES, *ADDITIVES),
PARACHUTE FLARES, BURNING RATE, CATALYSTS,
CALCIUM COMPOUNDS, OXALATES, IRON COMPOUNDS,
STEARATES, GUANIDINE NITRATES, CHEMICAL REACTIONS,
EPOXY PLASTICS, BONDING, STATISTICAL ANALYSIS,
LIGHT, INTENSITY, THERMAL ANALYSIS (U)
IDENTIFIERS: MK-24 AIRCRAFT FLARES (U)

THIS REPORT DESCRIBES PRELIMINARY EXPERIMENTS IN
THE STUDY OF THE EFFECTS OF ADDITIVES ON THE
PERFORMANCE OF ILLUMINATING FLARE COMPOSITIONS.
THE RESULTS INDICATE TRENDS IN PERFORMANCE AND
PROVIDE DATA FROM WHICH LARGE SCALE EXPERIMENTS CAN
BE PLANNED. A THEORY IS PROPOSED TO EXPLAIN THE
PERIODIC FLUCTUATION IN LIGHT OUTPUT OBSERVED IN MOST
FLARE SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-676 510 14/5 15/7
DENVER RESEARCH INST COLO MECHANICS DIV

RADIATION INTENSITY PRODUCED BY EXPLOSIVELY EXCITED
ARGON GAS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 28 DEC 67-30 AUG 68,
SEP 68 24P BLUNT, ROBERT M. ;
REPT. NO. DR1-4050-6807-F
CONTRACT: N00164-68-C-0229
MONITOR: NAD-CR, IDEP RGTR-132,415.00.00.00-X9-
15

UNCLASSIFIED REPORT

DESCRIPTORS: (*NIGHT WARFARE, *AERIAL
PHOTOGRAPHY), (*PHOTOFLASH BOMBS, HELIUM GROUP
GASES), ARGON, DETONATIONS, SHOCK WAVES,
LIGHT, INTENSITY, DETONATING CORD,
CHARGES (EXPLOSIVE), EXCITATION, AERIAL
RECONNAISSANCE, ILLUMINATION (U)

A STUDY WAS MADE OF THE TIME HISTORY OF THE
LUMINOUS INTENSITY PRODUCED BY A SHOCK WAVE IN ARGON
GAS. THE SHOCK WAVE WAS PRODUCED BY DETONATING A
45 GRAM CHARGE OF COMPOSITION C-4 ATTACHED TO ONE
END OF A 28 MM DIAMETER GLASS TUBE ABOUT 1.25 METERS
LONG. THE TUBE CONTAINED ARGON GAS AT A NOMINAL
630 TORR PRESSURE. SEVERAL CHARGE SHAPES WERE
USED; THERE WERE ALSO TWO TESTS IN WHICH 100 GRAIN
PRIMACORD LOCATED ON THE AXIS OF THE GLASS TUBE
REPLACED THE CHARGE OF C-4. BEST RESULTS WERE
OBTAINED FROM AN UNLINED CONICAL CAVITY CHARGE.
THE PEAK VALUE WAS 3.9×10 TO THE 7TH POWER
CANDELA, 6100 CANDELA SECONDS FROM A SHOCK MOVING AT
APPROXIMATELY 8300 METERS/SECOND. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-677 043 19/1
NAVAL AMMUNITION DEPOT CRANE IND

HK 24-SIZE CANDLE-PARACHUTE-DESTRUCT
CONFIGURATION OPTIMIZATION PROGRAM, (U)

SEP 68 25P KOCH, CLENNETH R. ;
REPT. NO. NAD-CR-RDTR-130
PROJ: A35-532-022/323-1/F008-17-02
MONITOR: IDEP 347.15.00.00-X9-02

UNCLASSIFIED REPORT

DESCRIPTORS: (PARACHUTE FLARES, DESTRUCTORS),
PARACHUTES, PARACHUTE FABRICS, AERODYNAMIC
CONFIGURATIONS, OPTIMIZATION, AERODYNAMIC
CHARACTERISTICS, SPECIFICATIONS,
PROGRAMMING (COMPUTERS) (U)
IDENTIFIERS: COMPUTER AIDED DESIGN (U)

ILLUMINATION FLARES HAVE DEMONSTRATED THEIR
EFFECTIVENESS FOR TARGET ACQUISITION AND NUMEROUS
OTHER USES. HOWEVER, DUE TO THE ENVIRONMENTS WHICH
CONSTITUTE THE ACTUAL USE OF THESE SYSTEMS, OTHER
ASPECTS SUCH AS REUSABILITY OF ANY HARDWARE BY
UNFRIENDLY PERSONS BECOME QUITE IMPORTANT. IN
ADDITION TO THIS, THE OPERATIONAL METHOD WHEREIN
THESE FLARES ARE UTILIZED HAS CHANGED CONSIDERABLY,
AND AN ADDITIONAL PROBLEM OF REMOVING THE SYSTEMS
FROM THE AIR AFTER BURNOUT IS IN EVIDENCE. THE
AIRCRAFT EFFECTIVENESS CAN BE SEVERELY HAMPERED BY
THE SYSTEMS NOT BEING DESTROYED OR REMOVED FROM THE
AIR AT THE CONCLUSION OF THEIR USEFULNESS. THUS,
IT CAN BE SEEN THAT IT IS OF EXTREME IMPORTANCE THAT
A PARACHUTE BE DESIGNED CONSIDERING ALL ASPECTS FROM
BOTH THE PERFORMANCE CRITERIA TO THE INTANGIBLE
ASPECTS SUCH AS THOSE MENTIONED ABOVE, TO HAVE A
COMPLETELY SATISFACTORY SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZON08

AD-679 159 19/1 14/2
NAVAL AMMUNITION DEPOT CRANE IND

SENSING HEAD CALIBRATION DATA 'SUPER MAPI'
SYSTEM, (U)

SEP 68 24P STOVALL, RONALD J. :
REPT. NO. NAD-CR-ROTR-117

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLARES, *ILLUMINATION),
(*SENSORS, CALIBRATION), TEST FACILITIES,
INTENSITY, PHOTOMETERS, SUSPENSION DEVICES,
TERRAIN, DATA PROCESSING SYSTEMS, VOLTAGE,
CONFIGURATION, RECORDING SYSTEMS, TEST METHODS,
TABLES, MATHEMATICAL ANALYSIS, PYROTECHNICS (U)
IDENTIFIERS: CANDLEPOWER, MAPI (MULTI ASPECT
ASSESSMENT OF PYROTECHNIC ILLUMINATION),
EVALUATION, FIELD OBSERVATIONS (U)

A DESCRIPTION IS GIVEN OF THE PROCEDURES USED IN
THE ORIGINAL CALIBRATION OF THE SENSING HEADS FOR THE
LARGE TOWER MAPI SYSTEM, ('SUPER MAPI').
A METHOD FOR THE INTERPRETATION OF FLARE
CANDLEPOWER FROM FIELD DATA IS ALSO GIVEN IN ADDITION
TO INFORMATION ON SENSING HEAD LOCATION, CELL
LOADING, AND ELECTRICAL WIRING. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-679 160 1971
DENVER RESEARCH INST COLO

THE FEASIBILITY OF USING THE PRESSURE-TIME DATA
FROM A SOLID-GAS REACTION AS A MEASURE OF THE
REACTIVITY OF A PYROTECHNIC MATERIAL.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

AUG 68 43P FAY, RICHARD J. ;
REPT. NO. DR1-2469
CONTRACT: N00164-67-C-0592
MONITOR: NAD-CR:IDEP R0TR-133,347,15.00.00-X9-
U3

UNCLASSIFIED REPORT

DESCRIPTORS: (•PYROTECHNICS, •BURNING RATE),
GASES, PRESSURE VESSELS, OXIDATION, MAGNESIUM,
ALUMINUM, BORON, OXIDIZERS, OXYGEN, NITRATES,
ATOMIZATION, HYDROGEN, CARBON MONOXIDE, REACTION
KINETICS

(U)

A STUDY WAS MADE OF THE FEASIBILITY OF USING THE
PRESSURE-TIME CURVE GENERATED BY THE REACTION OF A
SOLID PYROTECHNIC MATERIAL WITH A REFEREE GAS IN A
CLOSED VESSEL AS A MEASURE OF THE REACTIVITY OF THE
MATERIAL. IT WAS FOUND THAT FUELS SUCH AS
MAGNESIUM, ALUMINUM, AND BORON COULD BE REACTED WITH
OXYGEN WHILE OXIDIZERS SUCH AS SODIUM NITRATE,
POTASSIUM PERMANGANATE, AND MANGANESE DIOXIDE COULD
NOT BE REACTED ENERGETICALLY WITH HYDROGEN OR CARBON
MONOXIDE. THE RESULTS FROM STUDIES OF MAGNESIUM
REACTED WITH OXYGEN INDICATE THAT THE RELATIVE
REACTIVITY OF POWDERED MAGNESIUM PREPARED BY
ATOMIZATION AND BALLING CAN BE DISTINGUISHED BY THE
SLOPE ON THE LOG-LOG PLOT OF THE PRESSURE-TIME CURVE.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-679 911 19/1
DENVER RESEARCH INST COLO MECHANICS DIV

PROCEEDINGS OF FIRST PYROTECHNIC SEMINAR, (U)

OCT 68 440P BLUNT, R. M. I
MONITOR; NAD-CR RCTR-131

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: CONTAINS PROCEEDING OF PYROTECHNIC
SEMINAR (1ST), ESTES PARK, COLO., 13-16 AUG.
68.

DESCRIPTORS: (PYROTECHNICS, SYMPOSIA), HEAT OF
REACTION, SMOKE GENERATORS, DELAY
ELEMENTS(EXPLOSIVE), FLARES,
PROGRAMMING(COMPUTERS), ULTRASONIC WELDING,
CASTINGS, BONDING (U)

THE CONTENTS OF THE PROCEEDINGS OF THE FIRST
MILITARY PYROTECHNICS SEMINAR INCLUDE:
COLORED SMOKE SIGNALS, CASTABLE COMPOSITIONS;
IGNITION AND OUTPUT CHARACTERISTICS OF PYROTECHNICS
FOR ELECTROEXPLOSIVE DEVICE APPLICATIONS; AN
INTRODUCTION TO ADVANCED DELAY CORDS; SPECTRAL
OBSERVATIONS IN ILLUMINATING FLARES; COMPUTER
SOLUTION OF PYROTECHNIC THERMOCHEMISTRY PROBLEMS;
MATHEMATICAL SIMULATION MODELS; MEASUREMENT OF
ILLUMINATION-SOURCE-RELATED CHARACTERISTICS OF THE
CYANOGEN-OXYGEN-BORON TRICHLORIDE FLAME SYSTEM;
ULTRASONIC ENHANCEMENT OF PYROTECHNIC PROCESSING,
PRESSING, EXTRUSION, CASTING; CHARACTERIZATION AND
CHEMICAL REACTIVITY; NOVEL PYROTECHNIC COMPOSITIONS
FOR SCREENING SMOKES; HEATS OF REACTION PLOTS AS
DESIGN CRITERIA FOR PYROTECHNIC REACTIONS;
ULTRASONIC WELD ENCAPSULATION -- HEATLESS; HERMETIC
SEALING; PRINCIPLES AND APPLICATIONS OF EXPLOSIVE
BONDING; EARLY EXPLOSION PHENOMENA; THE EXPLOSIVE
FORMING OF METALS; COLORIMETRY AND RADIOMETRY. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-681 129 6/16 15/7 19/1
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

VISUAL SEARCH AND DETECTION UNDER SIMULATED FLARE
LIGHT.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
AUG 68 24P HILGENDORF, ROBERT ;
REPT. NO. AMRL-TR-68-112
PROJ: AF-7184
TASK: 718405

UNCLASSIFIED REPORT

DESCRIPTORS: (•PARACHUTE FLARES, SIMULATION),
(•VISUAL ACUITY, •NIGHT WARFARE), NIGHT VISION,
PERFORMANCE(HUMAN), TERRAIN MODELS,
IDENTIFICATION, ANALYSIS OF VARIANCE,
REACTION(PSYCHOLOGY), REACTION KINETICS,
TARGET RECOGNITION

(U)

PRELIMINARY LABORATORY RESEARCH ON METHODS FOR
EVALUATION AERIAL FLARE SOURCES AND FOR OPTIMIZING
THEIR PLACEMENT ARE DESCRIBED. TEN SUBJECTS
PERFORMED TARGET ACQUISITION (DETECTION AND
RECOGNITION) TASKS UNDER SIMULATED FLARE LIGHT AND
TEN, SERVING AS CONTROLS, UNDER SIMULATED DAYLIGHT
CONDITIONS. GENERALLY, TARGET ACQUISITION REQUIRED
AN AVERAGE OF APPROXIMATELY 90 SECONDS UNDER FOUR
SIMULATED MARK 24 FLARES DROPPED 0.25 MILE APART
AND IGNITED AT 2,000 FEET, COMPARED WITH AN AVERAGE
OF ABOUT 15 SECONDS UNDER SIMULATED SUNLIGHT
(SIMULATING THOSE LIGHT CONDITIONS CHARACTERISTIC
OF A PARTLY CLOUDY DAY). TARGET LOCATION
CONTRIBUTED SIGNIFICANTLY TO RESPONSE TIMES. THERE
WERE NO STATISTICALLY SIGNIFICANT DIFFERENCES IN
RESPONSE TIMES BETWEEN THE TWO TYPES OF TARGETS USED
(TRUCKS AND ANTIAIRCRAFT WEAPON SITES).
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-683 807 1971
SANDIA CORP ALBUQUERQUE N MEX

SUMMARY OF PYROTECHNIC DELAY INVESTIGATIONS FOR THE
AEC AND SANDIA CORPORATION, (U)

SEP 63 19P CONYN, RAYMOND H. I
REPT. NO. SC-479D(RR)

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, DELAY
ELEMENTS(EXPLOSIVE)), (*DELAY
ELEMENTS(EXPLOSIVE),
PERFORMANCE(ENGINEERING)), IGNITERS, ZIRCONIUM
COMPOUNDS, TUNGSTEN COMPOUNDS, MANGANESE COMPOUNDS,
BURNING RATE, CALORIMETRY, EXPLOSION GASES,
PARTICLE SIZE (U)

THE REPORT DESCRIBES RESEARCH PERFORMED ON THE
DELAY CHARACTERISTICS OF IGNITER MIXES RELATIVE TO
PROPORTION SIZES, PARTICLE SIZE, BURNING RATES, AND
THERMAL DELAYS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-684 616 21/2 19/1 20/12
WASHINGTON COLL CHESTERTOWN MD DEPT OF CHEMISTRY

EFFECT OF PHASE CHANGE IN SOLID-SOLID
REACTIONS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. OCT 64-OCT 67,
APR 68 102P MCLAIN, JOSEPH H. I
MCCLURE, MICHAEL D. I
REPT. NO. WDC-6667
CONTRACT: DA-18-035-AMC-77A
PROJ: DA-1-C-014501-B-71-A

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *BURNING RATE),
(*CHLORATES, *CRYSTAL LATTICE DEFECTS), DOPING,
COPPER COMPOUNDS, SULFUR, BICARBONATES,
POTASSIUM COMPOUNDS, THERMAL CONDUCTIVITY,
DIFFERENTIAL THERMAL ANALYSIS, IGNITION, MOISTURE,
MATHEMATICAL ANALYSIS
IDENTIFIERS: POTASSIUM CHLORATE

(U)

(U)

THE EFFECTS OF PHASE CHANGES, DEFECT STRUCTURE,
MECHANICAL TREATMENT, MOISTURE CONTENT AND DOPING OF
THE CONSTITUENTS OF THE POTASSIUM CHLORATE-SULFUR
SYSTEM ON THE REACTIVITY OF THE SYSTEM WAS
INVESTIGATED BY MEANS OF DIFFERENTIAL THERMAL
ANALYSIS, THERMOCONDUCTIMETRIC ANALYSIS AND BURNING
RATE STUDIES. THE EFFECT OF CONFINEMENT DURING
BURNING OF THE FUEL MIX (POTASSIUM CHLORATE, SULFUR
AND SODIUM BICARBONATE) WAS ALSO INVESTIGATED.
IT WAS FOUND THAT THE MECHANISM OF THE $KClO_3$ -
S REACTION IS INDEPENDENT OF THE DECOMPOSITION OF
THE $KClO_3$, BUT IS DEPENDENT UPON THE LATTICE
'LOOSENESS' OF THE $KClO_3$ AND ITS PERMEABILITY TO
THE SULFUR MOLECULES. IT WAS ALSO FOUND THAT
PREVIOUS TREATMENT OF THE CONSTITUENTS SUCH AS
MECHANICAL AND THERMAL TREATMENT OR THE PRODUCTION OF
CERTAIN DEFECT STRUCTURES HAVE AN IMPORTANT EFFECT ON
THE STABILITY OF THE SYSTEM. BURNING RATE STUDIES
INDICATED THAT THE GROWTH OF BURNING TO DETONATION IN
THE FUEL MIX IS PROFOUNDLY ENHANCED BY A LARGE K
FACTOR IN THE MUNITION. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-685 628 1971 7/4
NAVAL AMMUNITION DEPOT CRANE IND

THE EFFECT OF SELECTED CONTAMINANTS ON THE
HYGROSCOPICITY OF SODIUM NITRATE.

(U)

MAR 69 122P RIDLEY, WILLIAM L. :
REPT. NO. NAD-CR-RDTR-140
PROJ: A35532/323/69F17546502
MONITOR: IDEP 347.16.00.00-X9-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*NITRATES, *CHEMICAL CONTAMINATION),
(*HUMIDITY, NITRATES), (*PYROTECHNICS,
NITRATES), BURNING RATE, IMPURITIES,
FLUORIDES, CARBONATES, ACETATES, MERCURY
COMPOUNDS, ALUMINUM COMPOUNDS, ZIRCONIUM COMPOUNDS,
SULFATES, SODIUM CHLORIDE, FORMATES
IDENTIFIERS: SODIUM NITRATES, HYGROSCOPICITY,
ZIRCONIUM SULFATES

(U)

(U)

A PRELIMINARY SCREEN IS MADE OF THE EFFECTS OF 75
CONTAMINANTS ON THE HYGROSCOPICITY OF SODIUM NITRATE.
RESULTS INDICATE THAT CONTAMINANTS EXERT A
SIGNIFICANT EFFECT BOTH IN INCREASING AND IN
DECREASING HYGROSCOPICITY. VARIOUS SIDE EFFECTS
ARE NOTED, FOR EXAMPLE THE PRONOUNCED ANTICAKING
EFFECT OF ZIRCONIUM SULFATE AND OTHER COMPOUNDS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-686 424 19/1 17/8
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

VISUAL SEARCH AND DETECTION UNDER SIMULATED
FLARELIGHT: PART II. EVALUATION OF A 5,000,000
CANDLEPOWER (C-P) SOURCE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JAN 69 16P HILGENDORF, ROBERT L. ;
REPT. NO. AMRL-TR-68-112(11)
PROJ: AF-7104
TASK: 71U405

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART I, AD-681 129.

DESCRIPTORS: (•AIR DROP OPERATIONS, AIRCRAFT
FLARES), (•AIRCRAFT FLARES, ILLUMINATION),
TARGET ACQUISITION, SIMULATION, TERRAIN MODELS,
VISUAL ACUITY, PARACHUTE FLARES, FLOAT FLARES,
CONFIDENCE LIMITS, RESPONSES, REACTION KINETICS,
IDENTIFICATION, TARGET RECOGNITION (U)
IDENTIFIERS: EVALUATION (U)

PRELIMINARY LABORATORY RESEARCH ON METHODS FOR
EVALUATING AERIAL FLARE SOURCES AND FOR OPTIMIZING
THEIR PLACEMENT ARE DESCRIBED. TEN SUBJECTS
PERFORMED TARGET ACQUISITION (DETECTION AND
RECOGNITION) TASKS UNDER SIMULATED MARK 24
FLARELIGHT (2,000,000 CANDLEPOWER), AND TEN UNDER
SIMULATED BRITEYE FLARELIGHT CONDITIONS (5,000,
000 CANDLEPOWER). (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0H08

AD-687 270 6/5
EDGEWOOD ARSENAL MD

QUANTITATIVE ANALYSIS OF PHOSPHORUS-CONTAINING
COMPOUNDS FORMED IN WP BURNS.

(U)

DESCRIPTIVE NOTE: SPECIAL PUBLICATION,
MAY 69 27P WALKER, JAMES, JR.; WEXLER,
JACK (HILL, MYNA L.);
REPT. NO. EA-SP-100-49

UNCLASSIFIED REPORT

DESCRIPTORS: (WHITE PHOSPHORUS, BURNS),
(BURNS, QUANTITATIVE ANALYSIS), PHOSPHORUS
COMPOUNDS, TISSUES (BIOLOGY), PHOSPHORIC ACIDS,
PH, COAGULATION, THERAPY, HEAT, PATHOLOGY,
TABLES

(U)

THE OBJECT OF THIS WORK WAS TO DETERMINE THE TYPES
AND AMOUNTS OF PHOSPHORUS COMPOUNDS FORMED FROM
BURNING WP, AND TO DETERMINE THE ROLE OF THESE
COMPOUNDS IN THE TISSUE DAMAGE PRODUCED BY WP
BURNS. COMBUSTION OF WP ON THE SKIN RESULTED IN
THE FORMATION OF META- AND ORTHOPHOSPHORIC ACIDS AND
A SMALL AMOUNT OF RED PHOSPHORUS. THE PH ON THE
SURFACE OF THE SKIN FOLLOWING WASHING WITH WATER
IMMEDIATELY AFTER A WP BURN WAS 2.5. IN THE
TISSUE OF THE BURNED AREA NO PH LOWER THAN 4.5 WAS
FOUND. HEAT COAGULATION REACHED 3.0 MM BELOW THE
SKIN SURFACE, WHILE THE PH WAS ALTERED ONLY AS FAR
AS 1.5 MM BELOW THE SURFACE. IN ADDITION THE
PHOSPHATE CONTENT OF THE SKIN WAS NOT INCREASED BELOW
A DEPTH OF 2.0 MM. IT WAS CONCLUDED THAT (1)
THE DEHYDRATING EFFECT OF PHOSPHORUS PENTOXIDE FORMED
BY A WP BURN ON THE SKIN IS NEGLIGIBLE; (2)
HEAT COAGULATION OF THE TISSUE PENETRATES THE SKIN
MORE DEEPLY THAN ACIDS FORMED DURING A WP BURN; AND
(2) THE HEAT OF REACTION OF BURNING WP IS
PROBABLY PRIMARILY RESPONSIBLE FOR THE TISSUE DAMAGE
IN A WP BURN. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-688 769 19/1 20/6
NAVAL AMMUNITION DEPOT CRANE IND

VISIBLE RADIATION FROM ILLUMINATING FLARE FLAMES,

(U)

MAY 69 79P DOUDA, BERNARD E. :
REPT. NO: NAD-CR-RDTR-96
PROJ: A31310/323/69R0010401
MONITOR: IDEP 415.50.55.60-X9-03

UNCLASSIFIED REPORT

DESCRIPTORS: (*ILLUMINATING PROJECTILES, *FLARES),
(*ALKALI METAL COMPOUNDS, EMISSIVITY), BAND
SPECTRUM, FLAMES, RESONANCE ABSORPTION,
SPECTRA (INFRARED), SPECTRA (VISIBLE +
ULTRAVIOLET), CONTINUOUS SPECTRUM, SPECTRUM
ANALYZERS, INTENSITY, THESES (U)
IDENTIFIERS: EMISSION SPECTRA, VISIBLE SPECTRUM,
RESONANCE LINE CONTINUUM (U)

SPECTRA OF FLAMES FROM PYROTECHNIC FLARES
CONTAINING MAGNESIUM PLUS NITRATES OF LITHIUM,
SODIUM, POTASSIUM, RUBIDIUM, CESIUM, STRONTIUM, OR
BARIUM ARE PRESENTED TO SHOW EMISSION IN THE VISIBLE
AND NEAR-INFRARED REGIONS. THE STRONGEST FEATURE
IN EACH OF THE ALKALI METAL SPECTRA IS THE STRONG,
BROAD 'RESONANCE LINE CONTINUUM' IN THE RESONANCE
REGION APPROPRIATE TO EACH METAL. MOST OF THE
LIGHT FROM A SODIUM FLARE ORIGINATES FROM CONTINUOUS
EMISSION COMPOSED OF THE RESONANCE LINE CONTINUUM AND
THE BACKGROUND CONTINUUM. IN THE ALKALI METAL
SPECTRA, ATOMIC LINES (OTHER THAN THE SODIUM D
LINES) AND MOLECULAR BANDS ACCOUNT FOR ONLY A
SMALL AMOUNT OF THE LUMINOUS ENERGY EMITTED FROM THE
FLAME. IN CONTRAST, BAND EMISSIONS ARE THE
STRONGEST FEATURE OF STRONTIUM AND BARIUM FLAME
SPECTRA. WHEN ALKALI METALS ARE PRESENT IN HIGH
CONCENTRATIONS, THE EMISSION ASSOCIATED WITH THE
ALKALI METAL RESONANCE LINES HAS A DEEP MINIMUM OF
INTENSITY AT THE RESONANCE FREQUENCY WITH INTENSITY
MAXIMA AS MUCH AS 100A ON EITHER SIDE OF THE LINE
CENTER FREQUENCY. AS THE PRESSURE OF THE
ATMOSPHERE SURROUNDING THE FLAME IS REDUCED, THERE IS
A MARKED CHANGE IN SPECTRAL DISTRIBUTION OF THE
RADIANT ENERGY AND A REDUCTION OF THE INTENSITY OF
THE RESONANCE LINE CONTINUUM AND THE BACKGROUND
CONTINUUM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-689 092

1/3

CORNELL AERONAUTICAL LAB INC BUFFALO N Y FLIGHT RESEARCH
DEPT

STRUCTURAL REPORT: PIPER AZTEC FLARE MOUNT,

(U)

NOV 68 75P FERENC, A. I
REPT. NO. FRM-421

UNCLASSIFIED REPORT

PORTIONS OF THIS DOCUMENT ARE ILLEGIBLE. SEE
INTRODUCTION SECTION OF THIS ANNOUNCEMENT JOURNAL FOR CFST;
ORDERING INSTRUCTIONS.

DESCRIPTORS: (•COMMERCIAL PLANES, •AIRCRAFT
FLARES), ARTIFICIAL PRECIPITATION, SUPPORTS,
LOADING(MECHANICS), STRESSES, BENDING,
STRUCTURAL PROPERTIES, TORSION, TRAILING EDGE,
SILVER COMPOUNDS, IODIDES

(U)

IDENTIFIERS: AZTEC C AIRCRAFT, MOUNTINGS,
FLARE MOUNTS, SILVER IODIDE

(U)

THE REPORT DEALS WITH THE MOUNTING OF SILVER IODIDE
FLARES WHICH ARE USED TO SEED CLOUDS. THE MOUNT
WAS INSTALLED SPANWISE AFT OF THE WING TRAILING EDGE.
CHORDWISE MEMBERS EXTEND FROM THE MOUNT AND PICK UP
THE OUTBOARD WING RIB BOUNDING THE FUEL CELLS AND THE
INBOARD RIB OF THE WING TIP. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT: BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-689 116 19/1 13/8
NAVAL AMMUNITION DEPOT CRANE IND

HIGH INTENSITY TAMP-CAST ILLUMINATING FLARE. (U)

DESCRIPTIVE NOTE: SUMMARY REPT. JUL 67-DEC 68.
MAR 69 45P DOUDA, BERNARD E. I
REPT. NO. NAD-CR-RDTR-145
MONITOR: IDEP 415.80.55.60-X9-04

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIRCRAFT FLARES, MANUFACTURING
METHODS), CASTING, PRESSES(MACHINERY),
BINDERS, POLYMERIZATION, BURNING RATE, PARTICLE
SIZE, CONFIGURATION, ILLUMINATION, DROP TESTING (U)
IDENTIFIERS: BRITEYE FLARES, MLU-44/B FLARES,
LUU-3/B FLARES, LUU-2B FLARES, MAPI FLARES.
TAMP CASTING (U)

THE DEVELOPMENT OF A HIGH INTENSITY TAMP-CAST
ILLUMINATING FLARE IS DESCRIBED. THE FLARE
PRODUCED A LUMINOUS INTENSITY OF 25 MILLION CANDLES
FOR OVER TWO MINUTES. A BRIEF DISCUSSION IS
INCLUDED CONCERNING THE BINDER SYSTEMS USED TO MAKE
THE TAMP-CAST FLARES ALONG WITH THE ASSEMBLY OF A
CAPABILITY FOR TESTING THE FLARES. SUMMARY DATA OF
FLARE TESTS RELATED TO THIS WORK IS INCLUDED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-696 534 19/1 9/2
NAVAL AMMUNITION DEPOT CRANE IND

AIRCRAFT PARACHUTE FLARE SIMULATION,

(U)

OCT 69 95P ANGOTTI, JOSEPH J. I
REPT. NO. NAD-CR-RDTR-157
PROJ: A35532/323/69F17546502
MONITOR: IDEP 811.00.00.40-X9-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRCRAFT FLARES, ILLUMINATION),
COMPUTER PROGRAMS, PARACHUTE FLARES, MATHEMATICAL
MODELS, IGNITION, ALTITUDE, PARACHUTE DESCENTS,
DRAG, PROGRAMMING (COMPUTERS), SUBROUTINES,
PUNCHED CARDS, BURNING RATE, OPTIMIZATION (U)

IDENTIFIERS: *GROUND ILLUMINATION, *COMPUTERIZED
SIMULATION, IBM 360 COMPUTERS, FORTRAN 4 (U)

THE REPORT PRESENTS A COMPUTER PROGRAM WRITTEN IN
FORTRAN IV FOR THE IBM 360 THAT IS A SIMULATION
OF THE ILLUMINATION ON THE GROUND DURING THE DESCENT
OF AN AIRCRAFT PARACHUTE FLARE FROM IGNITION TO BURN
OUT. THE EFFECT OF AIR DENSITY ON THE VELOCITY IS
TAKEN INTO ACCOUNT BY A NUMERICAL TECHNIQUE. THE
ILLUMINATION ON HORIZONTAL AND VERTICAL SURFACES ON
THE GROUND ARE CONSIDERED. FOR THE SURFACE OF
INTEREST THE AREA CONSISTING OF THOSE POINTS HAVING
AT LEAST A CERTAIN VALUE OF ILLUMINATION IS COMPUTED.
THE PROGRAM SEARCHES FOR THE IGNITION ALTITUDE FOR
WHICH THIS AREA IS MAXIMIZED OVER THE BURN TIME,
FINDS THE IGNITION ALTITUDE FOR WHICH THE FLARE BURNS
OUT AT A CHOSEN ALTITUDE, OR SIMULATES THE DESCENT
WITH IGNITION AT A CHOSEN ALTITUDE. ATMOSPHERIC
TRANSMISSION IS NOT CONSIDERED IN THIS REPORT.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-698 286 19/1 20/6
NAVAL AMMUNITION DEPOT CRANE IND

VISIBILITY MODEL.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

NOV 69 63P BRADLEY, GERALD ;
REPT. NO. NAD-CR-RDTR-151
PROJ: A35532/323/69F17546502

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLARES, *TARGET RECOGNITION),
(*VISIBILITY, MATHEMATICAL MODELS),
PROGRAMMING (COMPUTERS), ILLUMINATION, FLIGHT,
SIMULATION, LIGHT TRANSMISSION, ATTENUATION,
PROBABILITY, DETECTION

(U)

IDENTIFIERS: GROUND TARGETS

(U)

A DISCUSSION OF THE FACTORS WHICH INFLUENCE THE
ABILITY OF AN AERIAL OBSERVER TO SEE AND IDENTIFY A
GROUND TARGET IS PROVIDED. ON THIS FOUNDATION
THERE HAS BEEN CONSTRUCTED A MATHEMATICAL MODEL WHICH
PREDICTS THE PROBABILITY OF DETECTION OF A GROUND
TARGET UNDER VARYING CONDITIONS OF ATMOSPHERIC
CLARITY, FLARE LOCATION AND INTENSITY AND THE
PERTINENT CHARACTERISTICS OF TARGET BACKGROUND.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-701 373 19/1 13/12
NAVAL AMMUNITION DEPOT CRANE IND

SAFETY TEST OF FLARE EXTRUSION FACILITY, (U)

DEC 69 30P RICHARDSON, JAMES I
REPT. NO. NAD-CR-RDTR-160

UNCLASSIFIED REPORT

DESCRIPTORS: (AIRCRAFT FLARES, MANUFACTURING
METHODS), (PROPELLANT GRAINS, EXTRUSION),
SAFETY, IGNITION, SAFETY DEVICES, TEST METHODS,
PRESSES(MACHINERY), DIES (U)
IDENTIFIERS: MARK-46 FLARES, DECOY FLARES (U)

A RECENT ACCIDENT IN THE FLARE EXTRUSION FACILITY
FATALLY BURNED THE PRESS OPERATOR. DURING
RESTORATION OF THE FACILITY, SEVERAL ADDITIONAL
SAFETY FEATURES WERE INCORPORATED. TANGIBLE PROOF
THAT THE CHANGES WERE ADEQUATE WAS DESIRED.
PERMISSION TO CONDUCT A CONTROLLED BURN TEST, WITH
THE PRESS LOADED SO AS TO SIMULATE A POINT IN THE
EXTRUSION CYCLE AT WHICH AN ACCIDENTAL IGNITION MIGHT
OCCUR, WAS REQUESTED AND GRANTED. THE TEST WAS
CONSIDERED TO BE SUCCESSFUL. CONFIDENCE IN
OPERATOR SAFETY HAS INCREASED. SIMILAR TESTS ON
OTHER OPERATIONS WOULD GREATLY IMPROVE PERSONNEL
SAFETY IN PYROTECHNICS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-702 752 1/3 19/1
NAVAL AMMUNITION DEPOT CRANE IND

MK 45 AIRCRAFT PARACHUTE FLARE OPTIMIZATION
PROGRAM PRELIMINARY EVALUATION OF EXPERIMENTAL
PARACHUTES AND PARACHUTE MATERIALS FLIGHT TEST
SERIES NO. 1: (U)

NOV 69 26P KOCH, CLENNETH R. I
REPT. NO. NAD-CR-RDTR-163

UNCLASSIFIED REPORT

DESCRIPTORS: (•PARACHUTE FLARES, PARACHUTES),
(•PARACHUTE FABRICS, RELIABILITY), FLIGHT
TESTING, PARACHUTE DESCENTS, OSCILLATION,
CONFIGURATION, STABILITY, OPTIMIZATION, BURNING
RATE (U)

IDENTIFIERS: MARK-45 FLARES (U)

THIS REPORT DEPICTS THE RESULTS OF MK 45
AIRCRAFT PARACHUTE FLARE FLIGHT TESTS
(EXPERIMENTAL PARACHUTES) CONDUCTED AT NAVAL
WEAPONS CENTER, CHINA LAKE, CALIFORNIA, ON
26 JUNE 1969 THROUGH 7 OCTOBER 1969. THIS WORK
WAS PERFORMED AS AUTHORIZED BY AIRTASK NO. A05-
532-057/323-1/W4703-03. DATA OBTAINED FROM THESE
FLIGHT TESTS INDICATE THE CROSS TYPE PARACHUTE
POSSESSES THE MOST ADVANTAGEOUS CHARACTERISTICS FOR
INCORPORATION INTO MK 45 AIRCRAFT PARACHUTE
FLARE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-704 052 19/1
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

SMOKE AGENTS AND DEVICES AND SMOKE-PRODUCING
SUBSTANCES,

(U)

JAN 70 99P ZAITSEY, G. S. IKUZNETSOV,
A. YA. ;
REPT. NO. FTD-MT-24-426-69
PROJ: FTD-7230282

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. MACHINE OF MONO.
DYMOVYE SREDSTVA ; DYMOOBRAZUYUSHCHIE VESHCHESTVA,
MOSCOW, 1961 P1-84, BY CHARLES T. OSTERTAG.

DESCRIPTORS: (•SMOKE GENERATORS, TACTICAL
WARFARE), (•SMOKE SCREENS, REVIEWS),
SHIPBORNE, ADAPTATION(PHYSIOLOGY), VISION,
NUCLEAR EXPLOSIONS, ACIDS, MORTAR AMMUNITION,
AEROSOLS, SMOKE BOMBS, PROTECTION, SULFOXIDES,
SULFONIC ACIDS, ANHYDRIDES, TITANIUM COMPOUNDS,
CHLORIDES, SILICON COMPOUNDS, TIN COMPOUNDS,
EXPANDED PLASTICS

(U)

IDENTIFIERS: TRANSLATIONS, WORLD WAR 2

(U)

THE AUTHOR DEALS WITH THE HISTORY AND DEVELOPMENT
OF SMOKE AGENTS AND SMOKE GENERATING DEVICES. THE
BOOK IS BASED EXTENSIVELY ON AGENTS AND EQUIPMENT OF
WORLD WAR II VINTAGE. REFERENCE IS MADE TO
AERIAL SPRAYING AND LAYING OF SMOKE SCREENS FROM
SHIPS, BUT THE EMPHASIS IS ON THE USE OF SMOKE BY THE
GROUND FORCES. CHAPTER I GIVES A BRIEF HISTORY
OF THE USE OF SMOKE SINCE THE FIRST WORLD WAR.
CHAPTER II AND III GO INTO THE PROPERTIES OF
AEROSOLS AS USED IN SMOKE SCREENS AND FOGS AND THE
CHEMICAL NATURE OF VARIOUS SMOKE-PRODUCING
SUBSTANCES. CHAPTER IV DEALS WITH SMOKE
GENERATING EQUIPMENT; HAND GRENADES, SMOKE POTS,
ARTILLERY AND MOTOR SHELLS, AERIAL BOMBS, AND SMOKE
MACHINES AND GENERATORS. CHAPTER V COVERS THE
TACTICAL APPLICATION OF SMOKE WITH SPECIAL SECTIONS
ON THE USE OF SMOKE IN CONNECTION WITH NIGHT VISION
DEVICES, INTERFERENCE OF RADAR STATIONS, PROTECTION
FROM LIGHT RADIATION OF A NUCLEAR EXPLOSION, AND
PROTECTION FROM BACTERIOLOGICAL WEAPONS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-704 125 1971 15/7
IIT RESEARCH INST CHICAGO ILL

VISUAL PERFORMANCE WITH SIMULATED FLARELIGHT IN
ARTIFICIAL CLOUDS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. FEB-AUG 69,
JAN 70 83P KATZ, SIDNEY IASE, PAUL K. I
RAISEN, ELLIOT I MILGENDORF, ROBERT L. I
REPT. NO. IITR1-C6173-1
CONTRACT: F33615-69-C-1386
PROJ: AF-7184
TASK: 718405
MONITOR: AMRL TR-69-121

UNCLASSIFIED REPORT

DESCRIPTORS: (•NIGHT WARFARE, COMBAT
SURVEILLANCE), (•COMBAT SURVEILLANCE,
ILLUMINATION), (•AIRCRAFT FLARES, FOG),
(•VISUAL ACUITY, FOG), HAZE, NIGHT VISION,
VISIBILITY, SOUTHEAST ASIA, AERIAL
RECONNAISSANCE, RESCUES, BRIGHTNESS, SIMULATION,
ARMY RESEARCH

(U)

IDENTIFIERS: GLARE, •ILLUMINATING FLARES,
BATTLEFIELD ILLUMINATION

(U)

THE REPORT DESCRIBES A LABORATORY PROCEDURE FOR
STUDYING THE EFFECTS OF FOG OR MIST ON VISUAL ACUITY
UNDER CONDITIONS OF NIGHT ILLUMINATION. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-704 980 19/1
PICATINNY ARSENAL DOVER N J

DEVELOPMENT OF THE XM191-193 GROUND ILLUMINATION
SIGNALS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 70 53P RIDDLE, C. H. ; JACKSON, B. ;
ANDREWS, J. E. , JR. ; KEYES, H. W. ;
REPT. NO. PA-TR-4013

UNCLASSIFIED REPORT

DESCRIPTORS: (*COLORED FLARES, DESIGN), COLORED
SMOKES, ILLUMINATION, SIGNALS, CHEMICAL COMPOUNDS,
BURNING RATE, PYROTECHNICS, IGNITERS,
MANUFACTURING METHODS, ENVIRONMENTAL TESTS
IDENTIFIERS: XM-191 FLARES, XM-192 FLARES, XM-
193 FLARES

(U)

(U)

THE DEVELOPMENT OF THE XM191-193 SERIES GROUND
ILLUMINATION SIGNALS FOR USE DURING THE HOURS OF
DARKNESS WAS SUCCESSFULLY ACCOMPLISHED. THIS REPORT
COVERS THAT DEVELOPMENT FROM THE INITIAL CONCEPT TO
THE DELIVERY OF ITEMS FOR USER EVALUATION. THE
SIGNALS HAVE THEIR OWN SEALED IGNITION SYSTEM, BURN
FOR A MINIMUM OF THIRTY SECONDS, AND ARE PROVIDED IN
THREE COLORS: YELLOW, RED AND GREEN. PACKAGED IN
A PLASTIC CYLINDRICAL CONTAINER, THE SIGNAL IS SMALL
AND LIGHTWEIGHT, AND IT PROVIDES A DISTINGUISHABLE
LIGHT AT A DISTANCE OF UP TO THREE MILES.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-707 720 9/1 22/1
DENVER RESEARCH INST COLO MECHANICS DIV

STUDY OF ILLUMINATING FLAMES FROM SOLID
REACTANTS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. AUG 68-APR 70,
JUN 70 82P BLUNT, ROBERT M. ;
REPT. NO. DR1-4178-7003-F
CONTRACT: N00164-69-C-0036
PROJ: A35-532/323/70F17-546-502
MONITOR: IDEP 415.80.55.20-X9-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *FLAMES),
(*COMBUSTION, PYROTECHNICS), FLARES, ATOMIC
SPECTROSCOPY, NITRATES, PERCHLORATES, ALKALI
METALS

(U)

THE REPORT SUMMARIZES AND DESCRIBES AN EXTENSIVE
SPECTRORADIOMETRIC STUDY OF THE RADIATION PRODUCED IN
THE 0.43 MICRON - 1.17 MICRON REGION BY FLAMES
RESULTING FROM THE COMBUSTION OF MAGNESIUM WITH THE
ALKALI AND ALKALINE EARTH NITRATES AND WITH SODIUM
PERCHLORATE AT AN AMBIENT AIR PRESSURE OF 630 TORR.
BOTH FUEL RICH AND STOICHIOMETRIC COMPOSITIONS WERE
STUDIED. ADDITIONAL STUDIES WERE MADE OF THE
INFLUENCE OF THE AMBIENT AIR PRESSURE ON THE
COMBUSTION OF A 57% MG, 38% NaNO_3 , 5%
LAMINAC COMPOSITION AT AMBIENT AIR PRESSURE RANGING
FROM 760 TORR TO 1 TORR TO DETERMINE QUANTITATIVELY
THE DECLINE IN OUTPUT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-708 821 19/1 21/2
PICATINNY ARSENAL DOVER N J PYROTECHNICS LAB

PRE-IGNITION AND IGNITION REACTIONS OF THE
PROPAGATIVELY REACTING SYSTEM MAGNESIUM-SODIUM
NITRATE-LAMINAC. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
JUN 58 11P HOGAN, VIRGINIA D. GORDON,
SAUL I
REPT. NO. PL-C-TN-23

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN COMBUSTION AND FLAME, V3 N1
P3-12 MAR 59.

DESCRIPTORS: (*PYROTECHNICS, *IGNITION),
(*FLARES, IGNITION), MAGNESIUM, NITRATES,
POLYESTER PLASTICS, BINDERS, DIFFERENTIAL THERMAL
ANALYSIS, THERMOGRAVIMETRIC ANALYSIS (U)

THE THERMAL IGNITION OF THE PROPAGATIVELY BURNING
SYSTEM MAGNESIUM-SODIUM NITRATE-LAMINAR WAS STUDIED
WITH RESPECT TO THE THERMAL PARAMETERS OF IGNITION,
PROPAGATIVE BURNING AND THE REACTION MECHANISMS
RESPONSIBLE FOR THESE PHENOMENA. DIFFERENTIAL
THERMAL ANALYSIS, THERMOGRAVIMETRY AND DETERMINATIONS
OF THE TIME TO IGNITION AS A FUNCTION OF TEMPERATURE
WERE EMPLOYED. ON A BASIS OF THESE EXPERIMENTAL
DATA, A MECHANISM IS POSTULATED FOR THE IGNITION
REACTIONS OF THE TERNARY SYSTEM IN WHICH THE THERMAL
DEGRADATION PRODUCTS OF THE STYRENATED POLYESTER
BINDER, LAMINAC, PLAY A DECISIVE ROLE. (U)
(AUTHOR)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-713 550 19/1 21/2 7/4
PICATINNY ARSENAL DOVER N J PYROTECHNICS LAB

GASEOUS ILLUMINANT PYROTECHNIC SYSTEMS, (U)

69 15P KIRSHENBAUM, ABRAHAM D. ;
TAYLOR, FRANCIS R. ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *LUMINESCENCE),
(*ILLUMINATING PROJECTILES, BRIGHTNESS), (*BORON
COMPOUNDS, ILLUMINATING PROJECTILES),
(*OXYFLUORIDES, ILLUMINATING PROJECTILES),
GASES, FLUORIDES, HYDROGEN, OXYGEN, OXIDES,
BURNING RATE, FLAMES, ALKYNES (U)
IDENTIFIERS: *BORON FLUORIDES, *BORON OXIDES,
ACETYLENE (U)

CANDLEPOWER EFFICIENCIES OBTAINABLE WITH
CONVENTIONAL PYROTECHNIC SYSTEMS SUCH AS MAGNESIUM-
SODIUM NITRATE HAVE ESSENTIALLY REACHED A MAXIMUM.
THUS AN INTENSIVE STUDY WAS INITIATED TO DETERMINE
IF GASEOUS SYSTEMS COULD DEVELOP LUMINOUS
EFFICIENCIES EXCEEDING THOSE OF STANDARD SOLID
SYSTEMS. THE FOLLOWING CONCLUSIONS WERE DRAWN FROM
THE PHOTOMETRIC AND SPECTROSCOPIC STUDIES AND THE
THEORETICAL COMPUTER ANALYSES OF THESE SYSTEMS:
THE BEST PRACTICAL SYSTEMS ARE THE $H_2 + OF_2 +$
 BF_3 AND $H_2 + O_2 + F_2 + BF_3$ FLAMES; THE
PRESENCE OF OXYGEN AS AIR, O_2 OR OF_2 IS ESSENTIAL
FOR MAXIMUM LIGHT OUTPUT; COMPUTER ANALYSES HAVE
SHOWN THAT HIGH TEMPERATURES ARE NECESSARY FOR
OBTAINING HIGH EFFICIENCIES; THE REACTION MECHANISM
IN THESE SYSTEMS ESSENTIALLY INVOLVES THE HYDROLYSIS
OF THE BORON FLUORIDES TO BOF AND BO₂H WHICH
ARE SUBSEQUENTLY CONVERTED TO THE PRIMARY EMITTERS
BO₂* AND BO*! BURNER DESIGN IS ALSO OF UTMOST
IMPORTANCE! AND THE LIGHT OUTPUTS OF THESE GASEOUS
SYSTEMS ARE GREATLY INCREASED BY THE USE OF
REFLECTORS AS SHOWN BY THE 12 FOLD INCREASE FOR THE
 $H_2 + OF_2 + BF_3$ SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-713 934 13/9 19/1
NAVAL AMMUNITION DEPOT CRANE IND

CONVERSION OF HOBART MODEL C-100 ELECTRIC
MIXER TO AIR DRIVE FOR USE IN MIXING
PYROTECHNIC COMPOSITIONS.

(U)

SEP 70 28P ARVIN, PATRICK L. IDARE,
SHERMAN E. I
REPT. NO. NAD-CR-RDTR-170

UNCLASSIFIED REPORT

DESCRIPTORS: (DRIVES, MODIFICATION KITS),
(PYROTECHNICS, MANUFACTURING METHODS),
MIXTURES, ELECTRICAL EQUIPMENT, PNEUMATIC DEVICES,
ELECTRIC MOTORS, TRANSMISSION GEARS, ASSEMBLING
IDENTIFIERS: MIXERS, PYROTECHNIC MIXES, AIR
MOTORS

(U)

(U)

DURING DEVELOPMENT OF A CATALYST GENERATOR AT
NAVAL AMMUNITION DEPOT, CRANE, INDIANA, A
SPECIAL NEED AROSE FOR A SOMEWHAT UNIVERSAL MIXER TO
THOROUGHLY BLEND PYROTECHNIC MIXES OF VARIOUS TYPES
UNDER SPECIAL CONDITIONS. THE SEARCH FOR A MIXER
WHICH COULD BE USED TO MIX THESE PYROTECHNIC MIXES OF
APPROXIMATELY 10 LBS. IN SIZE, ON A REPRODUCIBLE AS
WELL AS A PRODUCTIVE BASIS, LED TO THE MODEL C-
100 (PLANETARY ACTION) MIXER MANUFACTURED BY
THE HOBART MANUFACTURING COMPANY, TROY,
OHIO. PRELIMINARY TESTING OF THIS MIXER, WITH ITS
PLANETARY ACTION, PROVED THAT IT COULD MEET THE
CRITERIA ALREADY MENTIONED. ONE PROBLEM REMAINED
HOWEVER, THE MODEL C-100 MIXER IS EQUIPPED FROM
THE FACTORY WITH THE STANDARD TYPE ELECTRICAL MOTOR
AND RELATED EQUIPMENT WHICH WOULD NOT PERMIT THE
MODEL C-100 TO BE USED TO MIX PYROTECHNIC MIXES
BECAUSE OF THE SAFETY REQUIREMENTS. SINCE THIS
MIXER PROVIDED THE PROPER MIXING ACTION, IT WAS
SUGGESTED THAT THE ELECTRICAL MOTOR AND RELATED
CONTROLS (SWITCHES) BE REPLACED WITH AN AIR MOTOR
TO ADAPT THIS MIXER TO MEET THE SAFETY REQUIREMENTS
INVOLVED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-714 488 13/7 19/1
NAVAL AMMUNITION DEPOT CRANE IND

CONVERSION OF HOBART MODEL A-200 ELECTRIC
MIXER TO AIR DRIVE FOR USE IN MIXING
PYROTECHNIC COMPOSITIONS.

(U)

SEP 70 29P ARVIN, PATRICK L. IDARE,
SHERMAN E. I
REPT. NO. NAD-CR-RDTR-172
MONITOR: GIDEP 347.60.00.00-X9-01

UNCLASSIFIED REPORT

DESCRIPTORS: (•PNEUMATIC DEVICES, MODIFICATION
KITS), (•PYROTECHNICS, MIXTURES), ELECTRIC
MOTORS, PNEUMATIC SYSTEMS, SPARE PARTS,
MAINTENANCE, LUBRICATION, STRUCTURAL PARTS
IDENTIFIERS: AIR MOTORS, •MIXERS

(U)

(U)

DURING DEVELOPMENT OF A CATALYST GENERATOR, A
SPECIAL NEED AROSE FOR A SOMEWHAT UNIVERSAL MIXER TO
THOROUGHLY BLEND PYROTECHNIC MIXES OF VARIOUS TYPES
UNDER SPECIAL CONDITIONS. THE SEARCH FOR A MIXER
WHICH COULD BE USED TO MIX THESE PYROTECHNIC MIXES OF
APPROXIMATELY 20 LB. IN SIZE, ON A REPRODUCIBLE AS
WELL AS A PRODUCTIVE BASIS LED TO THE MODEL A-200
(PLANETARY ACTION) MIXER MANUFACTURED BY
THE HOBART MANUFACTURING COMPANY, TROY,
OHIO. PRELIMINARY TESTING OF THIS MIXER, WITH
ITS PLANETARY ACTION, PROVED THAT IT WOULD MEET THE
CRITERIA ALREADY MENTIONED. ONE PROBLEM REMAINED,
HOWEVER. THE MODEL A-200 MIXER IS EQUIPPED
FROM THE FACTORY WITH THE STANDARD TYPE ELECTRICAL
MOTOR AND RELATED EQUIPMENT WHICH WOULD NOT PERMIT
THE MODEL A-200 TO BE USED TO MIX PYROTECHNIC
MIXES BECAUSE OF SAFETY REQUIREMENTS. SINCE THIS
MIXER PROVIDED THE PROPER MIXING ACTION, IT WAS
SUGGESTED THAT THE ELECTRICAL MOTOR AND RELATED
CONTROLS (SWITCHES) BE REPLACED WITH AN AIR MOTOR
TO ADAPT THIS MIXER TO MEET THE SAFETY REQUIREMENTS.
A DESCRIPTION OF HOW THE MODEL A-200 MIXER
WAS CONVERTED FROM ELECTRICALLY TO AIR DRIVEN POWER
IS PRESENTED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-715 287 17/8
AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB
OHIO

FLARE RANGE ESTIMATION: EVALUATION OF
AIDS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 70 48P HILGENDORF, ROBERT L. ;
SIMONS, JOHN C. ;
REPT. NO. AMRL-TR-69-128
PROJ: AF-7184
TASK: 718405

UNCLASSIFIED REPORT

DESCRIPTORS: (•FLARES, RANGE FINDING),
PYROTECHNICS, NIGHT WARFARE, SIMULATION,
TRIANGULATION, PHOTOMETERS, TIME, TARGET
DISCRIMINATION, ACCURACY, VISUAL ACUITY, ERRORS,
CORRELATION TECHNIQUES

(U)

IDENTIFIERS: EVALUATION, RANGING DEVICES, VISUAL
AIDS

(U)

DEVICES FOR ESTIMATING THE RANGE TO A SIMULATED
PYROTECHNIC FLARE WERE EVALUATED AGAINST SEVERAL
UNAIDED CONDITIONS. TWO DEVICES BASED ON A
PHOTOMETRIC CONCEPT AND TWO BASED ON A GEOMETRIC
CONCEPT WERE USED. ONE WAS A HUMAN-ENGINEERED
TRIANGULATION DEVICE (RITCHIE RANGER MODIFIED).
THE ERRORS OF NAKED EYE JUDGMENTS ARE DISCUSSED.
ALSO DISCUSSED ARE TECHNOLOGICAL REQUIREMENTS FOR
OPERATIONAL RANGING DEVICES AND FUTURE PLANS FOR AN
INFLIGHT EVALUATION OF METHODS FOR FLARE RANGE
ESTIMATION. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-718 673 19/1 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

PROJECTILE AND CARTRIDGES, SMOKE. (U)

DESCRIPTIVE NOTE: MATERIEL TEST PROCEDURE.

JUN 69 9P
REPT. NO. MTP-4-3-108

UNCLASSIFIED REPORT

DESCRIPTORS: (*SMOKE PROJECTILES, TEST METHODS),
RANGES(ESTABLISHMENTS), FIRING
TESTS(ORDNANCE), EXTERIOR BALLISTICS,
METEOROLOGICAL PARAMETERS, SMOKE SCREENS (U)
IDENTIFIERS: *COMMODITY SERVICE TEST PROCEDURES (U)

THIS MATERIEL TEST PROCEDURE DESCRIBES THE
METHODS, TECHNIQUES AND TEST REQUIREMENTS NEEDED TO
DETERMINE THE DEGREE TO WHICH A SMOKE TEST PROJECTILE
MEETS THE REQUIREMENTS OF ITS QUALITATIVE
MATERIEL REQUIREMENTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-718 702 19/1 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

PROJECTILE, ILLUMINATING.

(U)

DESCRIPTIVE NOTE: MATERIEL TEST PROCEDURE.

JUN 69 13P
REPT. NO. MTP-4-3-116

UNCLASSIFIED REPORT

DESCRIPTORS: (+ILLUMINATING PROJECTILES, TEST
METHODS), EXTERIOR BALLISTICS, FIRING
TESTS(ORDNANCE), BURNING RATE, ACCURACY, ARMY
PERSONNEL, MAINTENANCE
IDENTIFIERS: *COMMODITY SERVICE TEST PROCEDURES

(U)

(U)

THE OBJECTIVE OF THIS DOCUMENT IS TO DESCRIBE THE
TESTS CONDUCTED TO DETERMINE THE SUITABILITY OF AN
ILLUMINATING PROJECTILE AND THE DEGREE TO WHICH IT
MEETS THE SPECIFICATIONS OF THE QUALITATIVE
MATERIEL REQUIREMENTS (QMR'S), OR SHALL
DEVELOPMENT REQUIREMENT (SDR'S).

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 720808

AD-718 752 19/1 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

**TARGET AND AREA SMOKE MARKING MUNITION
SUBSYSTEM FOR ARMY AIRCRAFT.**

(U)

DESCRIPTIVE NOTE: MATERIEL TEST PROCEDURE.

OCT 67 32P

REPT. No. NTP-8-2-190

UNCLASSIFIED REPORT

**DESCRIPTORS: (•SHOKE MUNITIONS, TEST METHODS),
AIRCRAFT EQUIPMENT, SAFETY, HANDLING,
RADIOGRAPHY, LEAKAGE(FLUID), EXPLOSIONS,
MARKERS**

(U)

**IDENTIFIERS: *COMMODITY ENGINEERING TEST PROCEDURES,
AIRCRAFT SMOKE MARKING MUNITION SYSTEMS**

(U)

THE OBJECTIVE OF THE TEST PROCEDURE IS TO OUTLINE A
SERIES OF ENGINEERING TESTS DESIGNED TO DETERMINE THE
TECHNICAL PERFORMANCE AND SAFETY ASPECTS OF THE TEST
ITEM. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-718 764 1971 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

GRENADERS, HAND OR WEAPON LAUNCHED, SMOKE/
INCENDIARY.

(U)

DESCRIPTIVE NOTE: MATERIEL TEST PROCEDURE.

AUG 69 35P

REPT. NO. MTP-8-2-091

UNCLASSIFIED REPORT

DESCRIPTORS: (*GRENADERS, TEST METHODS), SMOKE
MUNITIONS, INCENDIARY AMMUNITION, VISUAL INSPECTION,
ENVIRONMENTAL TESTS, DROP TESTING,
MAINTAINABILITY, FIRING TESTS(ORDNANCE)

(U)

IDENTIFIERS: *COMMODITY ENGINEERING TEST
PROCEDURES

(U)

THE OBJECTIVE OF THE COMMODITY ENGINEERING TEST
PROCEDURE IS TO ESTABLISH UNIFORM PROCEDURES FOR
DETERMINING AND EVALUATING THE TECHNICAL PERFORMANCE
OF SMOKE/INCENDIARY GRENADERS IN TERMS OF THE CRITERIA
ESTABLISHED BY APPLICABLE QUALITATIVE MATERIEL
REQUIREMENTS, SMALL DEVELOPMENT REQUIREMENTS,
TECHNICAL CHARACTERISTICS, AND OTHER DESIGN
REQUIREMENTS AND SPECIFICATIONS. THESE PROCEDURES
WILL ALSO PERMIT EVALUATION OF THE RELATIVE SAFETY OF
TEST ITEMS IN THE HANDS OF ARMY TROOPS AND THE
SUITABILITY OF ITEMS FOR SERVICE TESTING.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-718 784 19/1 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

PYROTECHNIC SIGNALS. (U)

DESCRIPTIVE NOTE: MATERIEL TEST PROCEDURE.

JUL 70 22P

REPT. NO. HTP-4-2-131

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES INTERIM PAMPHLET 10-95.

DESCRIPTORS: (PYROTECHNICS, TEST METHODS),
PYROTECHNIC PROJECTORS, FIRING TESTS(ORDNANCE),
ENVIRONMENTAL TESTS, FLARES,
PERFORMANCE(ENGINEERING), POSITION FINDING (U)
IDENTIFIERS: COMMODITY ENGINEERING TEST
PROCEDURES (U)

PROCEDURES UTILIZED FOR EVALUATING GROUND-AND AIR-
LAUNCHED PYROTECHNIC SIGNALS ARE DESCRIBED.
PYROTECHNIC SIGNALS LAUNCHED BY ARTILLERY WEAPONS
OR MORTARS ARE EXCLUDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-720 455 19/1
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA

PROCEEDINGS OF THE SYMPOSIUM ON
ELECTROEXPLOSIVE DEVICES (6TH), HELD IN SAN
FRANCISCO, CALIF. 8-10 JULY 1969.

(U)

JUL 69 833P

UNCLASSIFIED REPORT
AVAILABILITY: PAPER COPY AVAILABLE FROM FRANKLIN
INSTITUTE RESEARCH LABORATORIES, PHILADELPHIA,
PENNA. 19103. \$25.00 NO COPIES FURNISHED BY NTIS
OR DDC.

DESCRIPTORS: (*EXPLOSIVES INITIATORS, SYMPOSIA),
(*PYROTECHNICS, REPORTS), RELIABILITY,
SPACECRAFT COMPONENTS, MARKERS, CARTRIDGES(PAD),
MATHEMATICAL MODELS, EXPLODING WIRES, SAFETY,
INTERIOR BALLISTICS, NON-DESTRUCTIVE TESTING,
FILMS, ELECTRODES, LASERS, DETONATORS,
MICROMINIATURIZATION(ELECTRONICS),
RADIOFREQUENCY FILTERS, FIRING TESTS(OPDNANCE)
IDENTIFIERS: *ELECTROEXPLOSIVE DEVICES, RF
SUPPRESSION DEVICES

(U)

(U)

THE SIXTH (1969) EED SYMPOSIUM WAS ATTENDED
BY APPROXIMATELY 325 PEOPLE REPRESENTING 126
INDUSTRIAL CONCERNS, 43 GOVERNMENT AGENCIES AND 4
FOREIGN COUNTRIES (ENGLAND, CANADA, FRANCE, AND
ISRAEL). FOUR GENERAL SESSIONS WERE HELD IN
SAN FRANCISCO. THE FIFTH SESSION, CLASSIFIED
CONFIDENTIAL, WAS HELD AT THE TREASURE ISLAND
NAVAL BASE. THE PROCEEDINGS THEREFORE ARE IN
TWO VOLUMES; THIS IS THE UNCLASSIFIED VOLUME WHICH
CONTAINS 50 PAPERS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-721 697 11/5 19/1
NAVAL AMMUNITION DEPOT CRANE IND

HK 45 AIRCRAFT PARACHUTE FLARE OPTIMIZATION
PROGRAM: EVALUATION OF EXPERIMENTAL
PARACHUTES AND PARACHUTE MATERIALS FLIGHT
TEST SERIES NO. 2. (U)

MAR 70 47P KOCH, CLENNETH R. I
RICHARDSON, R. L. LEONARD, J. W. I
REPT. NO. NAD-CR-RDTR-164
MONITOR: GIDEP 347.15.00.00-X9-05

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED NOV 69, AD-
702 752.

DESCRIPTORS: (PARACHUTE FABRICS, RELIABILITY),
(PARACHUTE FLARES, PARACHUTES), FLIGHT TESTING,
PARACHUTE DESCENTS, OSCILLATION, CONFIGURATION,
STABILITY, OPTIMIZATION, BURNING RATE,
STATISTICAL DATA (U)
IDENTIFIERS: MARK-45 FLARES (U)

THE REPORT PRESENTS THE RESULTS OF HK 45 AIRCRAFT
PARACHUTE FLARE DEVELOPMENTAL FLIGHT TESTS
(EXPERIMENTAL PARACHUTES AND PARACHUTE MATERIALS)
CONDUCTED AT NAVAL WEAPONS CENTER, CHINA
LAKE, CALIFORNIA. THE BASIS FOR CHOICE OF
CHUTES AND MATERIALS FOR THESE TESTS WAS DERIVED FROM
RDTR NO. 163. DATA OBTAINED FROM THESE FLIGHT
TESTS INDICATE THE CROSS TYPE PARACHUTE USING CEREX
CLOTH (1.85 OZ/SQYD) TO EXHIBIT THE MOST
ADVANTAGEOUS CHARACTERISTICS FOR INCORPORATION INTO
THE HK 45 APF SYSTEM. THE DATA ALSO INDICATES
THAT A STRENGTH PROBLEM EXISTS WHEN THE SAME CANOPY
MATERIAL (CEREX) IS USED ON THE PRESENT MK 45
APF FLAT CIRCULAR CHUTE. A THIRD SYSTEM UTILIZING
A CROSS PARACHUTE WITH A MYLAR/DACRON LAMINATE
CLOTH WAS EVALUATED. THIS CHUTE ALSO HAD CLOTH
FAILURES FROM THE PARACHUTE SNATCH LOADING FORCES.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0H08

AD-722 707 19/1
NAVAL AMMUNITION DEPOT CRANE IND

FACTORS AFFECTING BULLET IMPACT INITIATION
OF PYROTECHNIC COMPOSITIONS, (U)

SEP 70 36P LIPSCOMB, CHARLES A. ;
ANGOTTI, JOSEPH J. ;
REPT. NO. NAD-CR-RDTR-173
MONITOR: GIDEP 347.40.00.00-X9-05

UNCLASSIFIED REPORT

DESCRIPTORS: (ILLUMINATING PROJECTILES,
SENSITIVITY), IMPACT TESTS, FLARES,
PROJECTILES, FIRING TESTS(ORDNANCE), IGNITION,
REACTION KINETICS, FRICTION, EXPERIMENTAL DATA (U)
IDENTIFIERS: ADIABATIC COMPRESSION (U)

THREE POSSIBLE MODES OF INITIATION BY BULLET IMPACT
OF A TYPICAL MAGNESIUM, SODIUM NITRATE, BINDER
ILLUMINATING SYSTEM ARE CONSIDERED. OF THE THREE--
MECHANICAL ACTIVATION, ADIABATIC COMPRESSION, AND
FRICTION--FRICTION APPEARS TO BE THE DOMINANT FACTOR
IN INITIATION OF THIS COMPOSITION BY BULLET IMPACT.
A DEMONSTRATED 'CURE' IS ALSO CITED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-724 652 19/1 11/9
NAVAL AMMUNITION DEPOT CRANE IND

RADIATION-INDUCED POLYMERIZATION. I. A
PYROTECHNIC BINDER, (U)

MAR 71 28P BIGGS, WILLIAM T. PARRISH,
CLYDE F. I
REPT. NO. NAD-CR-RDTR-182

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *BINDERS),
(*POLYMERIZATION, BINDERS), (*FLARES,
BINDERS), STYRENE PLASTICS, PEROXIDES, ACRYLIC
RESINS, PRODUCTION, NITRATES, EPOXY PLASTICS (U)
IDENTIFIERS: *RADIATION POLYMERIZATION (U)

IT IS THE INTENT OF THE WORK DESCRIBED IN THE
REPORT TO ILLUSTRATE A PROCESS WHICH READILY LENDS
ITSELF TO AN IRRADIATION CURING PROCESS, VIZ., THE
PRODUCTION OF PYROTECHNIC MATERIALS SUCH AS FLARES.
PRODUCTION METHODS USED TO DATE SUFFER HEAVILY FROM
THE LACK OF AUTOMATION AND PRESENT MANY INHERENT
SAFETY HAZARDS, MANY OF WHICH ARE BASED ON THE
REQUIREMENT THAT MANY OF THE PRODUCTION OPERATIONS
MUST BE HANDLED BY INDIVIDUALS, IN PARTICULAR, THE
BATCH MIXING PROCESSES. IT HAS BEEN THE INTENT OF
THE WORK DESCRIBED HERE TO ILLUSTRATE THAT: SUCH
A METHOD OF PRODUCING PYROTECHNIC MATERIALS IS
FEASIBLE; AND THIS METHOD PRODUCES ITEMS THAT CAN
BE APPLIED TO FUTURE USES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M08

AD-729 104 21/2 19/1
DENVER RESEARCH INST COLO MECHANICS DIV

FLARE FLAME PHENOMENA.

(U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 69-MAY 71,
JUN 71 45P BLUNT, ROBERT H. ;
REPT. NO. DR1-4339-7105-F
CONTRACT: N00165-69-C-0722
MONITOR: NAD-CR RDTR-186

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLAMES, *PHOTOGRAPHIC ANALYSIS),
(*FLARES, *FLAMES), MAGNESIUM, SODIUM,
COMBUSTION PRODUCTS, MIXTURES, ILLUMINATION

(U)

A PHOTOGRAPHIC TECHNIQUE WAS DEVELOPED USING VERY NARROW BANDPASS FILTERS TO RECORD SELECTIVE EMISSION BY MAGNESIUM AND SODIUM, THUS PROVIDING A MEANS OF MAPPING THE LOCATION OF THESE EMISSIONS IN HE. THE RELATION BETWEEN THE FLAMES OF STOICHIOMETRIC AND FUEL-RICH COMPOSITIONS WAS FURTHER INVESTIGATED, TO COMPARE THE ILLUMINANCE PRODUCED BY THE ENTIRE FLAME WITH THAT OF A VERY SMALL CENTRAL AREA. A BASIC PROBLEM PROVED TO BE THE DIFFICULTY OF DEFINING THE EFFECTIVE AREA OF THE FLAME IN A MEANINGFUL WAY, BECAUSE OF THE INFLUENCE OF THE SPECTRAL SENSITIVITY OF THE FILM ON THE APPARENT AREA. THE RELATIVE SIZE OF FLAMES OF SIMILAR SPECTRAL DISTRIBUTION, FROM NaN_3/MG COMPOSITIONS, WAS STUDIED WITH A SPECIAL EXTENDED RANGE FILM AND THE LOCATION OF REGIONS OF MAXIMUM LUMINANCE DETERMINED AT PRESSURES OF 760, 430, 150, 30 AND 6 TORR. NO OUTSTANDING DIFFERENCES WERE OBSERVED IN THESE SPECTRA FROM DIFFERENT POINTS IN THE FLAME. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-729 337 19/1
FRANKFORD ARSENAL PHILADELPHIA PA

QUALITATIVE ANALYSIS OF PRIMERS, TRACERS,
IGNITERS, INCENDIARIES, BOOSTERS, AND DELAY
COMPOSITIONS ON A MICRO SCALE BY USE OF
INFRARED SPECTROSCOPY. (U)

DESCRIPTIVE NOTE: TEST REPT.,
JUN 71 26P CHASAN, DAVID E. ; NORWITZ,
GEORGE ;
REPT. NO. FA-T71-6-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS,
*SPECTRA(INFRARED)), EXPLOSIVE MATERIALS,
INFRARED SPECTROSCOPY, AZIDES, FULMINATES,
STYPHNATES, RDX, HMX, TETRYL, TNT, OXALATES,
POLYVINYL CHLORIDE, OXIDES, PETN,
NITROCELLULOSE, NITRATES, CHLORATES, AMMONIUM
PERCHLORATE, LEAD COMPOUNDS, BARIUM COMPOUNDS,
IRON OXIDES, MIXTURES (U)
IDENTIFIERS: *SPECTROSCOPIC ANALYSIS, LEAD AZIDES,
MERCURY FULMINATE, LEAD STYPHNATE, AMMONIUM
NITRATE, PENTACYCLODECANES (U)

THE APPLICATION OF INFRARED SPECTROSCOPY TO THE
DETECTION OF THE CONSTITUENTS OF PRIMERS, TRACERS,
IGNITERS INCENDIARIES, BOOSTERS, DELAY COMPOSITIONS
ON A MICRO SCALE WAS INVESTIGATED. IT IS SHOWN THAT
THESE CONSTITUENTS CAN BE IDENTIFIED QUICKLY AND WITH
CERTAINTY, USING INFRARED PELLET TECHNIQUE TO DETECT
ORGANIC AND INORGANIC COMPOUNDS AND EMISSION
SPECTROSCOPY TO IDENTIFY THE METALS. IN MAKING THE
PELLET, 1 TO 2 MG OF THE MATERIAL IS GROUND WITH 300
MG OF POTASSIUM BROMIDE AND THE PELLET FORMED IN THE
DIE PRESS. THE GRINDING AND PRESSING OPERATION HAS
BEEN FOUND TO BE COMPLETELY SAFE EVEN WITH THE MOST
SENSITIVE EXPLOSIVES, ONCE THE MATERIAL HAS BEEN
MIXED WITH THE POTASSIUM BROMIDE. THE INFRARED
SPECTRA OF 43 OF THE MOST COMMON INGREDIENTS OF
PRIMERS, TRACERS, IGNITERS, INCENDIARIES, BOOSTERS,
AND DELAY COMPOSITIONS ARE GIVEN OVER THE RANGE 2.5
TO 50 MICRONS. THE QUALITATIVE ANALYSIS OF SEVEN
TYPICAL COMPOSITIONS IS DEMONSTRATED.
{AUTHOR} (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-729 845 19/1 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

TACTICAL LUMINANTS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.

AUG 71 17P

REPT. NO. HTP-4-2-132

PROJ: AMCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (•FLARES, TEST METHODS),
ILLUMINATION, COMBAT READINESS, INTENSITY,
DRIFT, SENSORS

(U)

IDENTIFIERS: TACTICAL LUMINANTS, COMMODITY
ENGINEERING TEST PROCEDURES

(U)

THE DOCUMENT PROVIDES DETAILED TESTING PROCEDURES
AND SAMPLE CHARACTERISTIC DIAGRAMS FOR TACTICAL
LUMINANTS UTILIZING A PYROTECHNIC EVALUATION RANGE.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-731 483 1971 1974
DENVER RESEARCH INST COLO MECHANICAL SCIENCES AND
ENVIRONMENTAL ENGINEERING DIV

CALCULATION OF SELF-SUSPENDED FLARE
TRAJECTORIES.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUN 69-31 DEC 70,
SEP 71 117P PETERSON, HARRY I
REPT. NO. DRI-4260-7102-F
CONTRACT: N00164-69-C-0216
PROJ: DRI-4260
MONITOR: NAD-CR RDTR-193

UNCLASSIFIED REPORT

DESCRIPTORS: (DESCENT TRAJECTORIES, MATHEMATICAL
MODELS), (PARACHUTE FLARES, DESCENT
TRAJECTORIES), AERODYNAMIC CHARACTERISTICS,
BURNING RATE, EQUATIONS OF MOTION, SPIN-STABILIZED
AMMUNITION, COMPUTER PROGRAMS
IDENTIFIERS: COMPUTER AIDED DESIGN, COMPUTERIZED
SIMULATION

(U)

(U)

THE REPORT SUMMARIZES AND DESCRIBES THE WORK
ACCOMPLISHED ON CONTRACT N00164-69-C-0216
(D.R.I. PROJECT 4260 - DIGITAL COMPUTER
SIMULATION AND CALCULATION OF TRAJECTORIES OF
SELF-SUSPENDED FLARES) DURING THE PERIOD
JUNE 1, 1969 THRU DECEMBER 31, 1970. THE WORK
WAS DIVIDED INTO TWO PHASES: THE STUDY OF THE
EFFECTS OF AERODYNAMIC COEFFICIENTS, LAUNCH VELOCITY
AND BURNING RATE ON FLARE TRAJECTORY, AND THE STUDY
OF THE EFFECTS OF AERODYNAMIC MOMENTS ON THE FLARE
TRAJECTORY. THE DESCRIPTION AND DOCUMENTATION OF
THE COMPUTER PROGRAMS FOR TWO DIMENSIONAL TRAJECTORY,
AND THREE DIMENSIONAL TRAJECTORY ARE PRESENTED IN
APPENDIX A OF THE REPORT. (AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-733 548 5/10 15/7
AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB
OHIO

VISUAL PERFORMANCE WITH SIMULATED FLARE
LIGHT; EFFECTS OF FLARE-IGNITION
ALTITUDE, (U)

71 9P HILGENDORF, ROBERT L. I
REPT. NO. AMRL-TR-70-30
PROJ: AF-7184

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN HUMAN FACTORS, V13 N4
P379-386 AUG 71.

DESCRIPTORS: (•TARGET ACQUISITION,
PERFORMANCE(HUMAN)), (•FLARES,
ILLUMINATION), SIMULATION, IGNITION, HUMAN
ENGINEERING, ALTITUDE, VISUAL PERCEPTION (U)

FOUR GROUPS OF TEN SUBJECTS PERFORMED SIMULATED
TARGET ACQUISITION (DETECTION AND RECOGNITION)
TASKS UNDER SIMULATED MARK 24 FLARE LIGHT (2,000,
000 CP.) ONE GROUP PERFORMED WITH SIX AERIAL
FLARES DROPPED 0.25 MI. APART (SIMULATED),
ANOTHER GROUP WITH SIX FLARES 0.50 MI. APART, ANOTHER
WITH FOUR FLARES 0.75 MI. APART, AND THE LAST GROUP
WITH TWO FLARES 1 MI. APART. ALL GROUPS PERFORMED
AT TWO SIMULATED OBSERVER ALTITUDES (2,000 AND 2,
500 FT. AND WITH THREE SIMULATED FLARE-IGNITION
ALTITUDES (2,000, 2,500, AND 3,000 FT.).
GENERALLY, MORE TARGETS WERE ACQUIRED AT THE 2,000-
FT. FLARE-IGNITION ALTITUDE. THERE WERE NO
STATISTICALLY SIGNIFICANT DIFFERENCES ATTRIBUTED TO
FLARE SEPARATION OR OBSERVER ALTITUDE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-733 592 19/1 14/2
AIR FORCE ARMAMENT LAB EGLIN AFB FLA

MEASUREMENT OF LINEAR BURN RATES OF HEAT
PRODUCING SYSTEMS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
SEP 71 11P DAVIS, D. A. ; LEFSTAD, ERIC
R. MCKENNEY, ROBERT L. , JR;
REPT. NO. AFATL-TR-71-123
PROJ: AF-1082
TASK: 108201

UNCLASSIFIED REPORT

DESCRIPTORS: (*BURNING RATE, MEASUREMENT),
(*PYROTECHNICS, BURNING RATE), PHOTOTUBES,
OPTICAL EQUIPMENT, DESIGN, RECORDING PAPER, TEST
METHODS

(U)

IDENTIFIERS: HEAT SOURCES, LINEAR BURNING
RATE

(U)

A PHOTOCELL APPARATUS HAS BEEN DESIGNED TO MEASURE
THE LINEAR BURN RATE OF HEAT PRODUCING SYSTEMS.
THE DEVICE CONSISTS OF AN ELECTRICAL UNIT AND A
PRECISION VIEWING UNIT CONTAINING TWO PHOTOCELLS. A
BAR SHAPED SAMPLE IS IGNITED AT ONE END, AND AS THE
REACTION PROCEEDS DOWN THE BAR, IT IS SENSED BY THE
PHOTOCELLS. THE RESULTING DECREASES IN RESISTANCE
AT THE PHOTOCELLS ARE RECORDED AS TWO ESSENTIALLY
PARALLEL LINES. THE DISTANCE BETWEEN THE TWO LINES
IS USED TO CALCULATE THE LINEAR BURN RATE. THE
DEVICE PROVIDES A SIMPLE METHOD FOR OBTAINING
REASONABLY PRECISE LINEAR BURN RATES.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-733 919 19/1
THIOL CHEMICAL CORP BRIGHAM CITY UTAH WASATCH DIV

REMOTELY INITIATED ILLUMINATING PERIMETER
ROCKET (RIPER).

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
OCT 71 198P MINERT, R. T. IFERRARA, J.

V. 1
REPT. NO. 0971-33623
CONTRACT: DAAD05-70C-0024
MONITOR: LNL CR-21F69

UNCLASSIFIED REPORT

DESCRIPTORS: (•ILLUMINATING PROJECTILES,
PERFORMANCE(ENGINEERING)), COUNTERINSURGENCY,
PARACHUTE FLARES, MANUFACTURING METHODS, QUALITY
CONTROL, ENVIRONMENTAL TESTS, FIRING
TESTS(ORDNANCE), PARACHUTE DESCENTS, BURNING
RATE

(U)

IDENTIFIERS: PERIMETER DEFENSE, RIPER(REMOTELY
INITIATED ILLUMINATING PERIMETER ROCKETS),
REMOTELY INITIATED ILLUMINATING PERIMETER ROCKETS

(U)

THE RIPER PROGRAM REPORTED HEREIN CONSISTED OF
THE DEVELOPMENT, FLIGHT TESTING, AND ENVIRONMENTAL
TESTING OF THE RIPER PROJECTILE AND LAUNCHER. THE
REPORT DISCUSSES THE DESIGN DETAILS AND FABRICATION
OF THE COMPONENT PARTS, THE ENVIRONMENTAL EXPOSURES,
AND TEST RESULTS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-737 199 1971
FRANKFORD ARSENAL PHILADELPHIA PA

NEW GENERATION TRACER CHARGING TECHNIQUES.

(U)

OCT 71 25P BRAUN, FRANK E. ; DIETSCH,
FRANCIS W. ; KOWALICK, JAMES F. ;
REPT. NO. FA-A71-10
PROJ: PRON-F6-0-A0106-01-FO-FN

UNCLASSIFIED REPORT

DESCRIPTORS: (*TRACERS(ORDNANCE), MANUFACTURING
METHODS), (*PYROTECHNICS,
*CHARGES(EXPLOSIVE)), STATE-OF-THE-ART REVIEWS,
PRODUCTION CONTROL, ASSEMBLING, AUTOMATA,
FEASIBILITY STUDIES

(U)

A HISTORY IS PRESENTED OF PYROTECHNIC CHARGING
TECHNIQUES FOR TRACER AMMUNITION FROM WORLD WAR
I TO THE PRESENT. CURRENT ARMY INTEREST IN
PLANT MODERNIZATION IS EXAMINED WITH EMPHASIS ON THE
ROTARY MODULE CONCEPT FOR TRACER CHARGING OPERATIONS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-740 117 1971
HONEYWELL INC HOPKINS MINN GOVERNMENT AND AERONAUTICAL
PRODUCTS DIV

AERODYNAMIC ANALYSIS OF THE SELF-SUSPENDED
FLARE.

(U)

DESCRIPTIVE NOTE: FINAL SUMMARY REPT. JUN 69-JUN 71,
FEB 72 218P STILLEY, G. D. I
CONTRACT: N00169-69-C-0662
MONITOR: MAD-CR RDTR-199

UNCLASSIFIED REPORT

DESCRIPTORS: (AIRCRAFT FLARES, AERODYNAMIC
CHARACTERISTICS), FEASIBILITY STUDIES, AERODYNAMIC
CONFIGURATIONS, ANGLE OF ATTACK, FREE FLIGHT
TRAJECTORIES, WIND TUNNEL MODELS, MATHEMATICAL
MODELS, TEST METHODS

(U)

IDENTIFIERS: SELF SUSPENDED FLARES, COMPUTERIZED
SIMULATION, FORTRAN 4 PROGRAMMING LANGUAGE,
FORTRAN

(U)

THE REPORT SUMMARIZES AND DESCRIBES THE WORK
ACCOMPLISHED UNDER THE CONTRACT (WHICH WAS A
DIGITAL COMPUTER SIMULATION AND CALCULATION OF
TRAJECTORIES OF SELF-SUSPENDED FLARES) DURING
THE PERIOD JUNE 1969 THRU JUNE 1970.
THEORETICAL TRAJECTORIES ARE PRESENTED FOR VARIOUS
INITIAL CONDITIONS AND DISK CONFIGURATIONS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-742 150 19/1
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA

PROCEEDINGS OF THE SYMPOSIUM ON EXPLOSIVES AND
PYROTECHNICS (7TH). HELD AT FRANKLIN
INSTITUTE RESEARCH LABORATORIES,
PHILADELPHIA, PA. ON 8-9 SEPTEMBER 1971.

(U)

SEP 71 308P
REPT. NO. FIRL-7E/P-71

UNCLASSIFIED REPORT
AVAILABILITY: PAPER COPY AVAILABLE FROM FRANKLIN
INST. RESEARCH LABS., PHILADELPHIA, PA. 19103,
\$25.00.

DESCRIPTORS: (*PYROTECHNICS, *SYMPOSIA),
(*EXPLOSIVE MATERIALS, SYMPOSIA), DESIGN,
ACTUATORS, CHARGES(EXPLOSIVE), DETONATIONS,
THERMAL ANALYSIS, TEST METHODS, PRODUCTION
CONTROL

(U)

THE SEVENTH SYMPOSIUM ON EXPLOSIVES AND
PYROTECHNICS WAS HELD AT THE FRANKLIN
INSTITUTE IN PHILADELPHIA, PA. ON SEPTEMBER 8
AND 9, 1971. THE PAPERS ARE DIVIDED INTO FOUR
SECTIONS. SECTION 1 IS CONCERNED WITH THEORETICAL
AND PERFORMANCE CHARACTERISTICS AND IS BASIC IN
NATURE. SECTION 2 IS CONCERNED WITH EVALUATION AND
TESTING TECHNIQUES. SECTION 3 PROCEEDS TO THE NEXT
LOGICAL STEP OF DISCUSSING NEW DEVELOPMENTS IN THE
FIELD AND INCLUDES BOTH NEW MATERIALS, IMPROVEMENT OF
OLD MATERIALS, NEW APPLICATIONS AND NEW TYPES OF
IGNITION SYSTEMS. FINALLY, SECTION IV
DISCUSSES PRODUCTION TECHNIQUES AND INCLUDES BOTH
USE OF EXPLOSIVE MATERIALS AND COMPONENTS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-801 856 15/2 19/1
EDGEWOOD ARSENAL MD

PYROTECHNIC THERMAL GENERATION: CS MIXTURES. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO. NOV 63-MAR 65,
NOV 66 23P REAVES, WOODROW W. MILLER,
JULIUS B. I
REPT. NO. EA-TN-241-2
PROJ: DA-1-B-522301-A-081
TASK: 1-B-522301-A-08101

UNCLASSIFIED REPORT

DESCRIPTORS: (•CS AGENTS, DISSEMINATION),
(•DISSEMINATION, •PYROTECHNICS), EFFECTIVENESS,
MIXTURES, SUCROSE, CLAY MINERALS, MAGNESIUM
COMPOUNDS, CARBONATES, LACTOSE, TEMPERATURE,
STORAGE, CONTAINERS, ALUMINUM, BUTYL RUBBER,
SYNTHETIC RUBBER, FLUORINE COMPOUNDS, RUBBER,
REDUCTION, STABILITY, PERFORMANCE(ENGINEERING),
BURNING RATE, POTASSIUM COMPOUNDS, CHLORATES,
PARTICLE SIZE (U)
IDENTIFIERS: MAGNESIUM CARBONATE, VITON,
POTASSIUM CHLORATE (U)

THE OBJECTIVE OF THIS STUDY WAS TO DEVISE A STABLE,
EFFICIENT, INTIMATE PYROTECHNIC MIXTURE CONTAINING
AGENT CS FOR USE IN VARIOUS TYPES OF ELASTOMERIC
AND SMALL MUNITIONS. A NUMBER OF INTIMATE CS
PYROTECHNIC MIXTURES WERE PREPARED AND LOADED INTO 3-
IN. ELASTOMERIC SPHERES OR 3-IN. ALUMINUM CANNISTERS.
THESE UNITS WERE PLACED INTO SURVEILLANCE AT EITHER
AMBIENT TEMPERATURES OR 160 F FOR VARIOUS TIME
INTERVALS. PYROTECHNIC MIXTURES CONTAINING CANE
SUGAR ARE MORE EFFECTIVE IN THE TUNNEL DISSEMINATION
OF CS WHEN KAOLIN IS PRESENT IN THE MIXTURE THAN
WHEN MAGNESIUM CARBONATE IS USED. THESE SUGAR-
KAOLIN MIXTURES SHOW EQUALLY GOOD RETURNS AS THOSE
MIXTURES CONTAINING LACTOSE-KAOLIN. A NUMBER OF
CS-INTIMATE MIXTURES EVALUATED FOR THIS STUDY SHOW
HIGH VAPORIZATION EFFICIENCIES AND EXCELLENT
SURVEILLANCE CHARACTERISTICS. SURVEILLANCE STUDIES
WITH THE AGENT CS LACTOSE-KAOLIN PYROTECHNIC
MIXTURE INDICATE STABILITY WHEN STORED IN ALUMINUM,
VITON B ELASTOMER AND BUTYL ELASTOMER AND
UNSATISFACTORY STORAGE CONDITIONS WHEN STORED IN
NAUTRAL LATEX CONTAINERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDN99

AD-805 969 17/1
DEVELOPMENT AND PROOF SERVICES ABERDEEN PROVING GROUND
MD

ENGINEERING TEST OF GRENADE DISPENSING ADAPTER, LWL
GDA-3 (SAFETY RELEASE). (U)

DESCRIPTIVE NOTE: FINAL REPT. 9 MAR-19 OCT 66,
DEC 66 40P SCHUELER, GERALD J. ;
REPT. NO. DPS-2209
PROJ: USATECOM-4-5-2980-11

UNCLASSIFIED REPORT

DESCRIPTORS: (•SMOKE MUNITIONS, GRENADES),
(•GRENADES, SCATTERING), CYCLIC RATE,
HANDLING, VIBRATION, BOMBERS, JET FIGHTERS,
HELICOPTERS, EXTERNAL STORES, MARKERS,
VIETNAM (U)

IDENTIFIERS: GDA-3 ADAPTERS, TLSS (TROOP LANDING
SMOKE SCREEN), LAU-32 DISPENSERS, SOUTH
VIETNAM, DISPENSERS, H-1 AIRCRAFT, U-6
AIRCRAFT, LAU-3 DISPENSERS (U)

AN ENGINEERING (SAFETY RELEASE) TEST WAS
CONDUCTED ON THE GRENADE DISPENSING ADAPTER.
TESTING CONSISTED OF A VIBRATION TEST, DROP TEST,
AND A USABILITY TEST. THE LAU-3 MODEL MET THE
CRITERIA FOR ALL TESTS AND IT WAS RECOMMENDED FOR
SAFETY RELEASE FOR BOTH ROTARY AND FIXED-WING
AIRCRAFT WITHIN THE LIMITATIONS IMPOSED BY APPLICABLE
SAFETY-OF-FLIGHT RELEASES. (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-811 218 19/1
DEVELOPMENT AND PROOF SERVICES ABERDEEN PROVING GROUND
ND

ENGINEER DESIGN TEST OF CARTRIDGE, 40-MM, SMOKE,
POSITION MARKER (SAFETY RELEASE). (U)

DESCRIPTIVE NOTE: FINAL REPT. 28 NOV 66-27 FEB 67,
APR 67 40P DEMPSEY, J. T. ;
REPT. NO. DPS-2324
PROJ: USATECOM-8-6-2310-04

UNCLASSIFIED REPORT

DESCRIPTORS: (*MARKERS, *SMOKE PROJECTILES),
RIFLE GRENADE LAUNCHERS, IGNITION, COMPATIBILITY,
COLORED SMOKES, FIRING TESTS(ORDNANCE),
ENVIRONMENTAL TESTS, HANDLING, AERIAL
RECONNAISSANCE, HUMIDITY, SAFETY, VIBRATION,
TEST METHODS, STORAGE, BALLISTICS (U)
IDENTIFIERS: M-79 GRENADE LAUNCHER (U)

ENGINEER DESIGN AND SAFETY TESTS OF THE 40-MM
POSITION MARKER (PM-2, LWL TASK 01-F-66)
WAS CONDUCTED AT ABERDEEN PROVING GROUND FROM
28 NOVEMBER 1966 TO 27 FEBRUARY 1967. THE
PURPOSE OF THE TEST WAS TO PROVIDE DEVELOPMENT AND
SAFETY-RELEASE DATA ON THE INITIAL PROTOTYPES OF THE
40-MM POSITION MARKER LAUNCHED FROM A 40-MM M79
GRENADE LAUNCHER. AFTER SUBJECTING THE TEST ITEM
TO ENVIRONMENTAL AND FIRING TESTS, THE RESULTS SHOW
THAT THE MARKERS ARE SAFE TO HANDLE, STORE, AND
SHOULDER-FIRE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-811 443 19/1
EDGEWOOD ARSENAL MD

CHARACTERISTICS OF POLYMERS FOR USE IN PYROTECHNIC
FUELS. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO. AUG 63-NOV 64,
MAR 67 25P AUGSTKALNS, VALDIS A. ;
BLISSEL, JOHN J. ;
REPT. NO. EA-TM-241-7
PROJ: DA-1-B-522301-A-081

UNCLASSIFIED REPORT

DESCRIPTORS: (*POLYMERS, *FUELS),
(*PYROTECHNICS, FUELS), IGNITION, COMBUSTION,
OPTIMIZATION, SULFUR COMPOUNDS, OXYGEN, CHEMICAL
BONDS, BURNING RATE, EPOXY PLASTICS, SENSITIVITY,
ESTERS, CROSSLINKING(CHEMISTRY), DATA,
TABLES, MIXTURES (U)

THE FEASIBILITY OF POLYMERIC COMPOUNDS IN THE DUAL
ROLE OF BONDING AND FUEL IN PYROTECHNIC MIXTURES HAS
BEEN DEMONSTRATED BY IGNITION AND COMBUSTION STUDIES
OF PYROTECHNIC GRAIN IN SMALL MUNITIONS. DATA
OBTAINED ALSO SHOW THE SUPERIORITY OF POLYMERIC FUELS
HAVING OPTIMUM CONTENTS OF SULFUR AND OXYGEN.
FORMULATIONS FOR TWO THEORETICALLY IDEAL POLYMERIC
BONDING AND FUEL COMPOUNDS HAVE BEEN POSTULATED.
{AUTHOR} (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-811 444 21/4 7/4 19/1
EDGEWOOD ARSENAL MD

THE SYNTHESIS OF POLYMERIC FUELS FOR USE IN THE
PYROTECHNIC DISSEMINATION OF CHEMICAL AGENTS AND
MIXTURES. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO. AUG 63-NOV 64,
MAR 67 26P AUGSTKALNS, VALDIS A. ;
MILLER, JULIUS ;
REPT. NO. EA-TH-241-5
PROJ: DA-1-B-522301-A-081
TASK: 1-B-522301-A-08101

UNCLASSIFIED REPORT

DESCRIPTORS: (*POLYMERS, *PYROTECHNICS),
(*FUELS, DISSEMINATION), (*CHEMICAL COMPOUNDS,
DISSEMINATION), POLYMERIZATION, ESTERS,
CROSSLINKING(CHEMISTRY), MOLECULAR WEIGHT,
CATALYSTS, GLYCOLS, EPOXY PLASTICS, ALCOHOLS,
ISOCYANATE PLASTICS (U)
IDENTIFIERS: CHEMICAL AGENTS, ARIZIDINE,
ESTERIFICATION (U)

BECAUSE OF THE INTEREST IN POLYMER BONDED
PYROTECHNIC FUELS, NEW POLYMERS WERE SYNTHESIZED FOR
THIS USE. INITIAL ESTERIFICATION REACTIONS WERE
CONDUCTED IN 600 MILLILITER PYREX BEAKERS, USING AN
ELECTRIC HEATER MAGNETIC STIRRER DEVICE TO PROVIDE
HEAT AND AGITATION. SUBSEQUENT REACTIONS WERE
CARRIED OUT IN A 500 MILLILITER THREE-NECK FLASK HEATED
WITH AN ELECTRIC MANTLE AND MAGNETICALLY STIRRED.
ONE NECK OF THE FLASK CONTAINED A THERMOMETER FOR
MONITORING REACTION TEMPERATURE, ANOTHER NECK
CONTAINED A REFLUX CONDENSER, AND THE THIRD NECK HELD
A CONDENSER FOR REMOVING WATER VAPOR. CROSSLINKING
EXPERIMENTS WERE CARRIED OUT IN SMALL ALUMINUM CUPS
CONTAINING ABOUT 10 GRAMS OF POLYMER MIX.
POLYESTER SYRUPS BASED UPON THIODIGLYCOL AND
SEVERAL DIFUNCTIONAL THIOACIDS HAVE EXCELLENT
PHYSICAL PROPERTIES FOR PYROTECHNIC USES. EPOXIDE
TYPE COMPOUNDS HAVE SHOWN MUCH PROMISE FOR
CROSSLINKING THE ABOVE SYRUPS; ARIZIDINE AND
ISOCYANATE COMPOUNDS ARE ALSO WORTH CONSIDERING.
FURTHER RESEARCH IN THIS AREA IS DESIRABLE TO
INCREASE THE OXYGEN CONTENT OF THE FUEL POLYMER AND
TO IMPROVE THE CROSSLINKING REACTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-815 815 21/4 19/1
EDGEWOOD ARSENAL MD

EVALUATION OF SUGAR-BASED SYRUPS AND POLYMERS AS
FUELS IN PYROTECHNIC SYSTEMS.

(U)

DESCRIPTIVE NOTE: TECHNICAL MEMO. AUG 63-NOV 64,
MAY 67 25P AUGSTKALNS, VALDIS A. I
MILLER, JULIUS I
REPT. NO. EATH-241-8
PROJ: DA-18522301A081
TASK: 18522301A6103

UNCLASSIFIED REPORT

DESCRIPTORS: (*CARBOHYDRATES, *POLYMERS),
(*FUELS, PYROTECHNICS),
SYNTHESIS(CHEMISTRY), CATALYSTS,
CROSSLINKING(CHEMISTRY), AGING(MATERIALS),
BONDING, DISSEMINATION, DEGRADATION,
POLYMERIZATION, STORAGE, CHEMICAL WARFARE AGENTS,
COMPATIBILITY, GLUCOSE, BURNING RATE,
SENSITIVITY, IGNITION, TEMPERATURE, SILICON,
SODIUM COMPOUNDS, CARBONATES, CONDENSATION,
LACTOSE, SHOCK WAVES

(U)

IDENTIFIERS: THIOSUGAR, SYRUPS

(U)

THIOSUGAR SYRUPS SUCH AS EXPERIMENTAL RR 110-3,
RR 214-6 AND RR 222-2, WHICH WERE SYNTHESIZED BY
RESIN RESEARCH LABORATORIES, WERE EVALUATED AND
DEMONSTRATED TO HAVE FAVORABLE COMBUSTION AND
SENSITIVITY CHARACTERISTICS IN PYROTECHNIC
COMPOSITIONS. DATA INDICATE THAT THESE SYRUPS
MIGHT BE SUCCESSFULLY UTILIZED FOR FUELS AND BONDING
IN PYROTECHNIC COMPOSITION FOR DISSEMINATION.
PROCESSING PROCEDURES MIGHT BE IMPROVED TO MINIMIZE
AGENT DEGRADATION DURING POLYMERIZATION AND STORAGE
AT 160 F. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-819 480 15/2
STANFORD RESEARCH INST MENLO PARK CALIF

CONDENSATION STUDIES.

(U)

DESCRIPTIVE NOTE: SPECIAL TECHNICAL REPT. NO. 10, JUL
65-JAN 67,
APR 67 55P ROBBINS, R. C. INAR, C. I
CONTRACT: DA-18-035-AMC-122(A)
PROJ: SRI-PAU-4900
TASK: 1B522301A08101

UNCLASSIFIED REPORT

DESCRIPTORS: (CHEMICAL WARFARE AGENTS,
DISSEMINATION), CONDENSATION, PARTICLE SIZE,
AEROSOLS, PYROTECHNICS, NUCLEATION, MATHEMATICAL
MODELS, DISTRIBUTION, PHYSICAL PROPERTIES, TEST
EQUIPMENT, SOLIDS, PARTICLES, LIQUIDS
IDENTIFIERS: PYROTECHNIC DISSEMINATION

(U)

(U)

CONDENSATION PROCESSES ARE IMPORTANT IN THE THERMAL
DISSEMINATION OF CW AGENTS. HETEROGENEOUS AND
HOMOGENEOUS NUCLEATION WAS STUDIED TO DETERMINE THE
IMPORTANT FACTORS CONTROLLING CONDENSING SYSTEMS.
EFFECTS OF SALT NUCLEI ON THE PARTICLE SIZE
DISTRIBUTION OF THE DISSEMINATED AEROSOL WERE STUDIED
AND SPECIAL PYROTECHNIC SYSTEMS WHICH WERE SALT
NUCLEI-FREE WERE INVESTIGATED. AEROSOLS COMPOSED
OF TWO- TO FIVE-MICRON-DIAMETER PARTICLES WITH A HIGH
DEGREE OF PARTICLE SIZE HOMOGENEITY MAKE THE OPTIMUM
AEROSOL FOR LUNG RETENTION AND MAXIMUM TRANSPARENCY.
THE PRODUCTION OF SUCH AN AEROSOL WAS SHOWN TO BE
FEASIBLE BY THE TECHNIQUE OF INCORPORATING
NONVOLATILE GIANT NUCLEI MATERIAL IN THE PYROTECHNIC
MIX. THESE GIANT NUCLEI WHEN DISSEMINATED WITH THE
AGENT VAPOR ACTED AS PREFERENTIAL CONDENSATION SITES
AND AS SMALL PARTICLE SCAVENGERS BY COAGULATION.
THE SECONDARY PROCESS OF COAGULATION WAS SHOWN TO
BE IMPORTANT IN REMOVING THE HIGHLY VISIBLE SUBMICRON
PARTICLES. A PYROTECHNIC DISSEMINATION SYSTEM WAS
SUGGESTED TO PRODUCE UNIFORM, LOW VISIBILITY AEROSOLS
WHICH INCLUDED COAGULATION OF THE SMALL PARTICLES TO
BE DISSEMINATED ON GIANT NUCLEI AT ELEVATED
TEMPERATURE AND HIGH CONCENTRATIONS. HOMOGENEOUS
NUCLEATION ALWAYS OCCURS IN CONDENSING SYSTEMS OF
HIGH VAPOR CONCENTRATIONS EVEN IN THE PRESENCE OF
FOREIGN NUCLEI. CRITICAL SUPERSATURATION RATIOS OF
A NUMBER OF COMPOUNDS WERE MEASURED BY A NEWLY
DEVELOPED EXPERIMENTAL METHOD.

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(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-819 593 15/2 21/2
STANFORD RESEARCH INST MENLO PARK CALIF

PYROTECHNIC DISSEMINATION RESEARCH STUDIES. (U)

DESCRIPTIVE NOTE: SPECIAL TECHNICAL REPT. NO. 16. APR
64-MAY 67,
JUN 67 109P BALDWIN, J. E. WOOLDRIDGE,
C. E. ;
CONTRACT: DA-16-035-AMC-122(A)
PROJ: SRI-PAU-4900
TASK: 18522301A08101

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *AEROSOL GENERATORS),
(*COMBUSTION, PYROTECHNICS), DISSEMINATION,
DIFFERENTIAL THERMAL ANALYSIS, BURNING RATE,
POTASSIUM COMPOUNDS, CHLORATES, ADIABATIC GAS
FLOW, THERMAL CONDUCTIVITY, CATALYSTS, LACTOSE,
SULFUR COMPOUNDS (U)

THE EXPERIMENTS WHICH WERE PERFORMED INCLUDED
ADIABATIC SELF-HEATING (ASH) MEASUREMENTS,
DIFFERENTIAL THERMAL ANALYSIS (DTA) MEASUREMENTS,
BURNING RATE MEASUREMENTS AS A FUNCTION OF PRESSURE,
TEMPERATURE PROFILE MEASUREMENTS IN THE COMBUSTION
ZONE, AND AGENT YIELD MEASUREMENTS UTILIZING A TOTAL
RECOVERY TECHNIQUE. THE ASH EXPERIMENTS DEFINED
THE ACTIVATION ENERGY OF A TYPICAL PYROTECHNIC AND OF
BINARY MIXTURES OF ITS INGREDIENTS AND SHOWED THAT A
BURNING-RATE DERIVED ACTIVATION ENERGY IS NECESSARILY
UNRELIABLE BECAUSE OF ITS DEPENDENCE ON THE PHYSICAL
PROCESS OF HEAT TRANSFER. THE DTA MEASUREMENTS
DEFINED THE ENDOTHERMS AND EXOTHERMS TO BE EXPECTED
AS A FUNCTION OF TEMPERATURE. BURNING RATE STUDIES
INDICATED THAT PYROTECHNICS HAVE A BURNING RATE LAW
WHICH RESEMBLES THAT OF SOLID ROCKETS. AGENT YIELD
MEASUREMENTS DEMONSTRATED THAT LARGE LAYER
PYROTECHNICS WERE MORE EFFECTIVE THAN SMALL
ONES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-821 062 21/2 19/1
EDGEWOOD ARSENAL MD

IGNITION TEMPERATURES. I. STANDARD PYROTECHNIC
MIXTURE AND COMPONENTS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. JAN 64-JAN 65,
OCT 67 33P KOKALAS, JOSEPH J. MILLER,
JULIUS B. IBRESCHI, ROBERT I
REPT. NO. EA-TR-4132
PROJ: DA-18522301A081
TASK: 18522301A081U1

UNCLASSIFIED REPORT

DESCRIPTORS: (•IGNITION, TEMPERATURE),
(•PYROTECHNICS, MIXTURES), (•LABORATORY
EQUIPMENT, MEASUREMENT), DIFFERENTIAL THERMAL
ANALYSIS, HAZARDS, MELTING POINT, SENSORS,
SENSITIVITY, THERMOCOUPLES, RECORDING SYSTEMS,
ALUMINUM COMPOUNDS, SILICATES, THERMAL
CONDUCTIVITY, QUINONES, COLORED SMOKE,
CARBONATES, COOLANTS, FUELS, DYES, TEST
METHODS (U)

IDENTIFIERS: ALUMINUM SILICATE (U)

A LABORATORY APPARATUS FOR THE DETERMINATION OF THE
IGNITION TEMPERATURES OF PYROTECHNIC MIXTURES THAT IS
BASED UPON DIFFERENTIAL THERMAL ANALYSIS (DTA) HAS
BEEN DESIGNED, CONSTRUCTED, AND TESTED. IT HAS
BEEN EVALUATED BY OBTAINING THERMOGRAMS OF A STANDARD
PYROTECHNIC MIXTURE AND EACH OF ITS COMPONENTS.
THE TEMPERATURES FOR THE CRYSTALLINE TRANSITIONS
AND MELTING POINTS OBTAINED FROM THE DTA CURVES OF
THE COMPONENTS OF THE PYROTECHNIC MIXTURE WERE FOUND
TO AGREE WITH THE CORRESPONDING DATA REPORTED IN THE
LITERATURE. THE APPARATUS HAS BEEN SHOWN TO GIVE
REPRODUCIBLE RESULTS. AN ADDITIONAL ADVANTAGE IS
THE SMALL SAMPLE SIZE REQUIRED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-823 504 7/4
EDGEWOOD ARSENAL MD

MEASUREMENT OF THE PARTICLE-SIZE DISTRIBUTION OF
THERMALLY GENERATED SMOKES. 1. DYE SMOKES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. JUL 64-AUG 65,
NOV 67 39P DEINER, ALBERT MILHAM,
MERKILL E. I
REPT. NO. EA-TR-4114
PROJ: DA-18522301A081
TASK: 18522301A08101

UNCLASSIFIED REPORT

DESCRIPTORS: (*AEROSOLS, PARTICLE SIZE),
(*COLORED SMOKES, SCATTERING), SMOKES,
DISSEMINATION, DISTRIBUTION, DYES, QUINONES,
INSTRUMENTATION, SMOKE GENERATORS, PHOTOMETERS,
PYROTECHNICS, MEASUREMENT, AMINES (U)
IDENTIFIERS: ANTHRAQUINONE/DIALKYLAMINO,
ANTHRAQUINONE/1-METHYLAMINO (U)

THE OBJECTIVE OF THE WORK CONTAINED IN THIS REPORT
WAS TO DEVELOP TECHNIQUES AND INSTRUMENTATION TO
MEASURE THE PARTICLE-SIZE DISTRIBUTION IN DYE SMOKES.
THIS REPORT PRESENTS A METHOD OF DETERMINING THE
PARTICLE-SIZE DISTRIBUTION OF SMOKES UTILIZING THE
BATTELLE CI-S-8 IMPACTOR. A SPECIAL LONG-
PATH PHOTOMETER, WHICH WAS DESIGNED TO DETERMINE THE
SMALL AMOUNTS OF DYE COLLECTED ON THE IMPACTOR
SLIDES, IS DESCRIBED IN DETAIL. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-830 371 19/1 13/12
ARMY MATERIEL COMMAND WASHINGTON D C

ENGINEERING DESIGN HANDBOOK. MILITARY PYROTECHNICS
SERIES. PART TWO-SAFETY, PROCEDURES AND GLOSSARY. (U)

OCT 63 62P
REPT. NO. AMC-PAM-706-186

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *SAFETY),
(*HANDBOOKS, PYROTECHNICS), MANUFACTURING
METHODS, PROCESSING, PARTICLE SIZE, DICTIONARIES,
HAZARDS, DATA (U)

THE HANDBOOK DEALS WITH THE PROBLEMS OF SAFETY IN
THE PYROTECHNICS LABORATORY AND PLANT, PROCESSING
PROCEDURES AND EQUIPMENT, PARTICLE SIZE PROCEDURES,
AND CONTAINS A GLOSSARY OF TERMS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-832 051 19/1 7/4 21/2
IIT RESEARCH INST CHICAGO ILL

THE CATALYSIS OF THERMAL DECOMPOSITION AND BURNING
REACTIONS OF FUEL-OXIDANT COMPOSITIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 3 OCT 66-30 SEP 67,
MAY 68 73P FREEMAN, ELI S. IRUDLOFF,
WINFRIED K. I
REPT. NO. IITRI-U6054-12
CONTRACT: DAAA15-67-C-0019
PROJ: DA-1C014501871A

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, *CATALYSIS),
OXIDIZERS, POTASSIUM COMPOUNDS, CHLORATES,
FUELS, SULFUR, CRYSTAL LATTICE DEFECTS, DOPING,
SINGLE CRYSTALS, DIFFERENTIAL THERMAL ANALYSIS,
THERMOGRAVIMETRIC ANALYSIS, PYROLYSIS, COMBUSTION,
CHLORIDES, PERCHLORATES, ELECTRICAL CONDUCTANCE,
RADIATION DAMAGE, SHOCK(MECHANICS), CATALYSTS (U)
IDENTIFIERS: *POTASSIUM CHLORATE (U)

THE EFFECTS OF DEFECT STRUCTURE AND DOPING OF
POTASSIUM CHLORATE ON ITS CHEMICAL REACTIVITY WITH
RESPECT TO ITS PROPAGATIVE REACTIONS WITH SULFUR WAS
INVESTIGATED. THE PREPARATION OF DOPED SINGLE
CRYSTALS OF POTASSIUM CHLORATE WAS CONTINUED DURING
THE ENTIRE PROGRAM. THE CROPS OF SINGLE CRYSTALS
WERE ANALYZED FOR THEIR DOPANT CONTENTS. THE
INFLUENCE OF DOPING ON THE THERMAL DECOMPOSITION OF
POTASSIUM CHLORATE WAS INVESTIGATED BY DTA AND
TGA. THE EFFECT OF POTASSIUM CHLORIDE AND
PERCHLORATE AS AN INTERMEDIATE REACTION PRODUCT ON
THE THERMAL DECOMPOSITION OF POTASSIUM CHLORATE WAS
STUDIED. THESE EXPERIMENTS ARE NECESSARY FOR
ESTABLISHING THE BASIS FOR EVALUATING THE REACTIVITY
OF POTASSIUM CHLORATE WITH SULFUR. ELECTRICAL
CONDUCTIVITY STUDIES WERE INITIATED TO CORRELATE
ELECTRONIC DEFECT STRUCTURE WITH THE REACTIVITY
BEHAVIOR OF POTASSIUM CHLORATE. LOW TEMPERATURE
ISOTHERMAL INVESTIGATIONS WERE CONDUCTED TO EVALUATE
POSSIBLE REACTION MECHANISMS. THE EFFECT OF
IRRADIATION AND MECHANICAL SHOCK ON THE DECOMPOSITION
OF POTASSIUM CHLORATE WAS PROBED. THE COMBUSTION
REACTION OF MIXTURES OF SULFUR WITH DOPED POTASSIUM
CHLORATE AND OF MIXTURES WITH SELECTED METAL OXIDES
WAS INVESTIGATED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-832 086 7/4 7/2 19/1
NAVAL AMMUNITION DEPOT CRANE IND

A PRELIMINARY INVESTIGATION OF THE REACTIVITY OF
AMORPHOUS RED PHOSPHORUS. (U)

MAK 68 110P RIPLEY, WILLIAM ILIPSCOMB.
CHARLES A. I
REPT. NO. NAD-CR-RDTR-110

UNCLASSIFIED REPORT

DESCRIPTORS: (*PYROTECHNICS, REACTION KINETICS),
(*PHOSPHORUS, REACTION KINETICS), SULFUR
COMPOUNDS, OXYCHLORIDES, PHOSPHORUS COMPOUNDS,
CHLORIDES, CRYSTAL STRUCTURE, MOLECULAR STRUCTURE,
DENSITY, POLYMERS, SURFACE AREA, CALORIMETRY (U)
IDENTIFIERS: *RED PHOSPHORUS, *AMORPHOUS RED
PHOSPHORUS (U)

THE REACTIVITY OF AMORPHOUS RED PHOSPHORUS
SPECIMENS OBTAINED FROM SIX COMMERCIAL MANUFACTURERS
WAS INVESTIGATED BY A NON-ISOTHERMAL REACTION WITH A
SULFURYL CHLORIDE-BENZENE MEDIUM. VARIATIONS IN
THE REACTIVITY OF THE PHOSPHORUS SPECIMENS WERE
MEASURED. THE REACTION WAS FOUND TO BE A PSEUDO-
FIRST REACTION, $2 P + 3 SO_2Cl_2 \rightarrow 3 SO_2 +$
 $2 PCl_3$, THE RATE MECHANISM OF WHICH IS REPRESENTED
BY THE DIFFERENTIAL EQUATION: $DT/DT = B (T -$
 $T_1)$. VARIOUS CHEMICAL AND PHYSICAL PROPERTIES OF
THE PHOSPHORUS WERE INVESTIGATED IN A SEARCH FOR THE
UNDERLYING CAUSES OF THE OBSERVED DIFFERENCES IN
REACTIVITY, ALTHOUGH NO SINGLE PROPERTY WAS FOUND TO
ACCOUNT FOR THESE DIFFERENCES IN ALL THE SAMPLES.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /70M08

AD-833 991 13/12 1/3
KIDUE (WALTER) AND CO INC BELLEVILLE N J

INVESTIGATION OF PYROTECHNIC GENERATED GAS DISCHARGE
FIRE EXTINGUISHING SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 68,
MAY 68 95P DEROUVILLE, M. THEBENSTREIT,
L. V. I
CONTRACT: AF 33(615)-3648
PROJ: AF-6075
TASK: 607507
MONITOR: AFAPL TH-64-47

UNCLASSIFIED REPORT

DESCRIPTORS: (•FIRE EXTINGUISHERS, DESIGN),
(•AIRCRAFT FIRES, FIRE EXTINGUISHERS), GAS
GENERATING SYSTEMS, PYROTECHNICS, EXPLOSIVES
INITIATORS, HYPERSONIC FLIGHT, SUPERSONIC PLANES,
PERFORMANCE(ENGINEERING), SIMULATION, WEIGHT,
EFFECTIVENESS, PRESSURIZATION, PROPELLANT GRAINS,
TEMPERATURE, VAPOR PRESSURE, FEASIBILITY STUDIES,
AVIATION SAFETY, FIRE SAFETY (U)

ADVANCED AIRCRAFT OPERATING IN SUPERSONIC AND
HYPERSONIC FLIGHT REGIMES WILL IMPOSE MANY
ENVIRONMENTAL PROBLEMS ON AIRCRAFT SUBSYSTEMS.
FIRE EXTINGUISHING EQUIPMENT WILL BE REQUIRED TO
OPERATE EFFICIENTLY OVER A -65F TO 500F
TEMPERATURE RANGE. TO MEET THIS REQUIREMENT, A
SUBSCALE PYROTECHNIC FIRE EXTINGUISHING
SYSTEM WAS DESIGNED, DEVELOPED AND FIRE TESTED
UNDER SIMULATED FLIGHT CONDITIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-841 032 19/1 20/13 15/2
IIT RESEARCH INST CHICAGO ILL

INVESTIGATION OF CHEMICAL SPECIES AND TEMPERATURES
PRESENT IN PYROTECHNIC FLAMES.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. APR 66-MAR 68,
OCT 68 68P GROVE, EWART L. IRIBICH,
FRANK JOHN I
REPT. NO. IITRI-U6044-11
CONTRACT: DA-18-U35-AMC-739(A)
PROJ: DA-1-B-522301-A-001

UNCLASSIFIED REPORT

DESCRIPTORS: (CHEMICAL PROJECTILES, THERMAL
ANALYSIS), (PYROTECHNICS, CHEMICAL REACTIONS),
CS AGENTS, COMBUSTION, CHEMICAL COMPOUNDS,
TEMPERATURE, SIMULATORS, QUINONES, PELLETS,
INFRARED SPECTROSCOPY, MASS SPECTROSCOPY,
INTERFEROMETERS, COLORS, TEST EQUIPMENT,
SPECTRUM SIGNATURES, PARTICLE SIZE

(U)

IDENTIFIERS: METHYLAMINO QUINONES, EMISSION
SPECTROSCOPY

(U)

A NUMBER OF PHYSICAL TECHNIQUES WERE USED TO STUDY
THE REACTION PRODUCTS, TEMPERATURE AND RATES OF
COMBUSTION OF A PYROTECHNIC MIXTURE CONTAINING THE
AGENT CS OR THE SIMULANT 1-METHYLAMINOANTHRA-
QUINONE. THESE INCLUDED EMISSION SPECTROSCOPY,
RAPID-SCAN SPECTROSCOPY, INFRARED ABSORPTION
SPECTROMETRY, INTERFEROMETRY, COLOR AND INFRARED CINE
STUDIES, AND SPECTROSCOPIC AND THERMOCOUPLE
TEMPERATURE MEASUREMENTS. SPECTROSCOPIC
TEMPERATURE MEASUREMENTS WERE PERFORMED USING THE
TWO-LINE, THE TWO-COLOR, AND THE MAXIMUM RADIANT
ENERGY WAVELENGTH TECHNIQUES. THE DIFFERENCE IN
THESE AND THERMOCOUPLE RESULTS CAN BE DUE TO THE
TOTAL REGION OBSERVED BY EACH TECHNIQUE. CHEMICAL
PURITY, POWDER AND/OR CRYSTAL SIZE OF THE
CONSTITUENTS AND PRESSURE USED TO PRODUCE THE PELLET
INFLUENCED THE RATE OF REACTION AND TEMPERATURE.
THE CHEMICAL SPECIES OBSERVED BY EMISSION INFRARED
ABSORPTION SPECTROMETRY AND INTERFEROMETRY WERE
ESSENTIALLY THOSE ASSOCIATED WITH THE COMBUSTION OF
THE FUEL. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-860 068 13/12 1/2 21/5
KIDDE (WALTER) AND CO INC BELLEVILLE N J

DEVELOPMENT OF FULL SCALE PYROTECHNIC
GENERATED GAS DISCHARGE FIRE EXTINGUISHING
SYSTEM.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 69 91P HEBENSTREIT, L. V. IDE
ROUVILLE, M. IROGENS, K. I
CONTRACT: F33615-68-C-1121
PROJ: AF-3048
TASK: 304807
MONITOR: AFAPL TR-69-66

UNCLASSIFIED REPORT

DESCRIPTORS: (•TURBOJET ENGINES, FIRE SAFETY),
(•FIRE EXTINGUISHERS, DESIGN), PYROTECHNICS,
TEMPERATURE, AIRCRAFT FIRES, AVIATION SAFETY,
JET ENGINE NACELLES, PRESSURIZATION, GAS
GENERATING SYSTEMS, PROPELLANT GRAINS, EXPLOSIVES
INITIATORS, EFFICIENCY,
PERFORMANCE(ENGINEERING), TEST METHODS,
HALOGENATED HYDROCARBONS, CHLORINE COMPOUNDS,
BROMINE COMPOUNDS

(U)

IDENTIFIERS: •PYROTECHNIC GENERATED GAS DISCHARGE
FIRE EXTINGUISHERS, FIRE EXTINGUISHING AGENTS,
EVALUATION

(U)

ADVANCED AIRCRAFT OPERATING IN SUPERSONIC AND
HYPERSONIC FLIGHT REGIMES IMPOSE MANY ENVIRONMENTAL
PROBLEMS ON AIRCRAFT SUBSYSTEMS. FIRE EXTINGUISHING
EQUIPMENT WILL BE REQUIRED TO OPERATE EFFICIENTLY
OVER A -65F TO 500F TEMPERATURE RANGE. TO MEET
THIS REQUIREMENT, A FULL SCALE PYROTECHNIC FIRE
EXTINGUISHING SYSTEM WAS DESIGNED, DEVELOPED AND
FIRE TESTED UNDER SIMULATED FLIGHT CONDITIONS.
THIS PYROTECHNIC EXTINGUISHING SYSTEM
(WHEREIN PYROTECHNIC PRESSURIZATION REPLACES
NITROGEN AS AN ENERGY SOURCE) WILL FUNCTION
EFFECTIVELY UNDER EXTREME ENVIRONMENTAL CONDITIONS
AND ITS PERFORMANCE ON A WEIGHT EFFECTIVENESS BASIS
IS SUPERIOR TO THAT OF THE STANDARD NITROGEN
PRESSURIZED UNITS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-860 396 19/1
ABERDEEN PROVING GROUND MD MATERIEL TEST DIRECTORATE

ENGINEERING TEST OF FLARE, SURFACE,
PARACHUTE, XM183, (BATTLEFIELD ILLUMINATION
SYSTEM). (U)

DESCRIPTIVE NOTE: FINAL REPT. 13 NOV 68-15 JUN 69,
SEP 69 137P SANBORN, JOHN F. MILLER,
RICHARD M. I
REPT. NO. APG-MT-3307
PROJ: RDT/E-2-X-6253U1-D-718, USATECOM-H-MU-
009183U01

UNCLASSIFIED REPORT

DESCRIPTORS: (1) PARACHUTE FLARES,
PERFORMANCE (ENGINEERING), ILLUMINATION,
ALUMINUM, IGNITION, MOISTUREPROOFING, VISUAL
INSPECTION, PACKAGING, FUZE FUNCTIONING ELEMENTS,
IGNITERS, FUSE LIGHTERS, SAFETY, RELIABILITY,
HAZARDS, PLASTICS, STORAGE, ENVIRONMENTAL TESTS,
TEMPERATURE, DETONATING CORD, DROP TESTING (U)
IDENTIFIERS: *XM-183 FLARES, *M-183 FLARES,
M-60 IGNITERS, GUN PROPELLED FLARES (U)

THIS ENGINEERING TEST OF THE FLARE, SURFACE,
PARACHUTE, XM183, WAS PERFORMED TO DETERMINE IF THE
TEST ITEM MEETS THE CRITERIA OF THE SDR AND IS SAFE
FOR SERVICE TESTING. THE TEST ITEMS WERE SUBJECTED
TO 12 ENVIRONMENTAL SUBTESTS AND WERE FIRED FOR
PERFORMANCE AND SAFETY DATA. THREE DEFICIENCIES OF
THE SYSTEM TESTED WERE NOTED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-860 514 1971
ARMY INFANTRY BOARD FORT BENNING GA

SERVICE TEST OF FLARE, SURFACE, PARACHUTE,
XM183 (BATTLEFIELD ILLUMINATION
SYSTEM).

(U)

DESCRIPTIVE NOTE: FINAL REPT. 3 FEB-24 MAR 69,
APR 69 65P STEUER, CHARLES E. I
REPT. NO. USAIB-3095
PROJ: RDT/E-2-X-625301-D-718, USATECOM-8-MU-
009183002

UNCLASSIFIED REPORT

DESCRIPTORS: (*PARACHUTE FLARES, ILLUMINATION),
PERFORMANCE(ENGINEERING), PORTABLE, IGNITION,
FUZE FUNCTIONING ELEMENTS, TEST METHODS, LIFE
EXPECTANCY, SAFETY, HAZARDS, VISIBILITY, NIGHT
VISION, PLASTICS, HOLDING, CONTAINERS, ARMY
PERSONNEL, TRANSPORTATION
IDENTIFIERS: *XM-183 FLARES, *M-183 FLARES,
M-60 IGNITERS

(U)

(U)

SERVICE TEST OF THE BATTLEFIELD ILLUMINATION
SYSTEM WAS CONDUCTED TO DETERMINE THE SUITABILITY
OF THE BATTLEFIELD ILLUMINATION SYSTEM FOR US
ARMY USE IN A VARIETY OF TEST CONDITIONS UNDER
SIMULATED FIELD AND TACTICAL USE. USAIB CONCLUDES
THAT THE BATTLEFIELD ILLUMINATION SYSTEM
(FLARE, SURFACE, PARACHUTE, XM183) IS
CAPABLE OF PROVIDING SUFFICIENT ILLUMINATION TO
DETECT TARGETS AT A RANGE OF 200 METERS; IS SIMPLE TO
MAINTAIN, EMPLACE, AND OPERATE AND IS PORTABLE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-868 258 19/1 15/7
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

FLARE, AIRCRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.

FEB 70 23P

REPT. NO. HTP-4-3-148

PROJ: AMCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (•NIGHT WARFARE, ILLUMINATION),
(•AIRCRAFT FLARES, TEST METHODS), FLIGHT
TESTING, AVIATION SAFETY, HAZARDS, COMPATIBILITY,
AIR DROP OPERATIONS, MAINTAINABILITY, QUALITY
CONTROL, SPECIFICATIONS

(U)

THIS ARMY SERVICE TEST PROCEDURE DESCRIBES
TEST METHODS AND TECHNIQUES FOR EVALUATING AIRCRAFT
FLARES AND FLARE DISPENSERS RELATED TO THE
CRITERIA STATED IN APPLICABLE QUALITATIVE
MATERIEL REQUIREMENTS (QMR), SMALL
DEVELOPMENT REQUIREMENTS (SDR), OR OTHER
APPROPRIATE REQUIREMENTS AND SPECIFICATIONS, AND FOR
DETERMINING THE SUITABILITY OF SUCH ITEMS FOR SERVICE
USE BY THE U. S. ARMY. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-871 762 19/1 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

GRENADERS, HAND OR WEAPON LAUNCHED, SMOKE,
COLORED, MARKING. (U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.

AUG 69 38P
REPT. NO. MTP-8-2-092
PROJ: AMCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (*GRENADERS, SMOKE MUNITIONS),
(*SMOKE MUNITIONS, TEST METHODS), FIRE SAFETY,
VISUAL INSPECTION, DROP TESTING, ENVIRONMENTAL
TESTS, HANDLING, TEST METHODS, MAINTAINABILITY,
FIRING TESTS(ORDNANCE) (U)
IDENTIFIERS: COMMODITY ENGINEERING TEST
PROCEDURES (U)

THIS ENGINEERING TEST PROCEDURE DESCRIBES
TEST METHODS AND TECHNIQUES FOR EVALUATING THE
TECHNICAL PERFORMANCE AND CHARACTERISTICS OF COLORED
SMOKE GRENADERS AND FOR DETERMINING SUITABILITY OF
TESTED ITEMS FOR SERVICE USE IN THE US ARMY.
THE EVALUATION IS RELATED TO CRITERIA EXPRESSED IN
APPLICABLE QUALITATIVE MATERIEL REQUIREMENTS,
SMALL DEVELOPMENT REQUIREMENTS, TECHNICAL
CHARACTERISTICS, OR OTHER APPROPRIATE DESIGN
REQUIREMENTS AND SPECIFICATIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-871 791 19/1 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

TARGET AND AREA SMOKE MARKING MUNITION
SUBSYSTEM FOR ARMY AIRCRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.
MAY 70 20P
REPT. NO. MTP-8-3-190
PROJ: AMCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (SMOKE MUNITIONS, TEST METHODS),
CONFIGURATION, INSTALLATION, MISSION PROFILES,
AIR DROP OPERATIONS, METEOROLOGICAL PARAMETERS,
SAFETY, HUMAN ENGINEERING, FLIGHT TESTING, TEST
METHODS

(U)

IDENTIFIERS: COMMODITY SERVICE TEST PROCEDURES

(U)

THIS ARMY SERVICE TEST PROCEDURE DESCRIBES
TEST METHODS AND TECHNIQUES FOR EVALUATING THE
PERFORMANCE AND CHARACTERISTICS OF AERIAL MARKING
(TARGET AND AREA SMOKE) SUBSYSTEMS FOR ARMY
AIRCRAFT, AND FOR DETERMINING THEIR SUITABILITY FOR
SERVICE USE BY THE U. S. ARMY. THE EVALUATION
IS RELATED TO CRITERIA EXPRESSED IN APPLICABLE
QUALITATIVE MATERIEL REQUIREMENTS (QMR),
SMALL DEVELOPMENT REQUIREMENTS (SDR),
TECHNICAL CHARACTERISTICS (TC), OR OTHER
APPROPRIATE DESIGN REQUIREMENTS AND SPECIFICATIONS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-672 078 19/1 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

ARCTIC ENVIRONMENTAL TEST OF SMOKE
MUNITIONS AND GENERATING EQUIPMENT. (U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.
JUN 70 12P
REPT. NO. MTP-8-4-011
PROJ: AMCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (•SMOKE MUNITIONS, COLD WEATHER
TESTS), SMOKE GENERATORS, GRENADES,
ENVIRONMENTAL TESTS, ARCTIC REGIONS, MAINTENANCE,
RELIABILITY (U)
IDENTIFIERS: ENVIRONMENTAL TEST PROCEDURES (U)

THE ENVIRONMENTAL TEST PROCEDURE DESCRIBES
TEST METHODS AND PROCEDURES FOR EVALUATING THE
PERFORMANCE AND CHARACTERISTICS OF SMOKE
MUNITIONS AND SMOKE GENERATING EQUIPMENTS
UNDER ARCTIC WINTER ENVIRONMENTAL CONDITIONS.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-874 207

1971

ARMY TROPIC TEST CENTER FORT CLAYTON CANAL ZONE

INTEGRATED ENGINEERING AND SERVICE (TROPIC ENVIRONMENTAL) TEST OF FLARE, SURFACE, PARACHUTE XM183 (BATTLEFIELD ILLUMINATION SYSTEM).

(U)

DESCRIPTIVE NOTE: FINAL REPT. 27 FEB 69-2 MAR 70,
MAY 70 45P MARTINEZ, JORGE L. IGIDLEY,
CLARENCE D. I

REPT. NO. USATTC-7005004

PROJ: RDT/E-2-X-625301-D-718, USATECOM-8-MU-009-
183-006

UNCLASSIFIED REPORT

DESCRIPTORS: (•PARACHUTE FLARES, TROPICAL TESTS),
GUN LAUNCHED, STORAGE, DEGRADATION, HUMIDITY,
MALFUNCTIONS, SAFETY, ARMY EQUIPMENT,
ILLUMINATION, NIGHT WARFARE

(U)

IDENTIFIERS: XM-183 FLARES, M-183 FLARES

(U)

AN INTEGRATED ENGINEERING SERVICE TEST OF THE FLARE, SURFACE, PARACHUTE, XM183 (BATTLEFIELD ILLUMINATION SYSTEM) WAS CONDUCTED BY THE US ARMY TROPIC TEST CENTER FROM 27 FEBRUARY 1969 TO 2 MARCH 1970. THE PURPOSE OF THIS TEST WAS TO DETERMINE THE SUITABILITY OF THE XM183 FLARE FOR US ARMY USE AFTER PROLONGED PERIODS OF EXPOSURE IN THE HUMID TROPIC ENVIRONMENT UNDER OPEN AND COVERED OPEN-SIDED STORAGE CONDITIONS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-892 213 19/1 21/2
NAVAL ORDNANCE STATION INDIAN HEAD MD

FLAME PROPAGATION PARAMETERS OF PYROTECHNIC
DELAY AND IGNITION COMPOSITIONS,

(U)

DEC 71 13P ROSE, JAMES E. ;
REPT. NO. NOS-IHMR-71-168
PROJ: A350-5322/286-B/1F17-546-501

UNCLASSIFIED REPORT

DESCRIPTORS: (*DELAY ELEMENTS(EXPLOSIVE), FLAME
PROPAGATION), (*PYROTECHNICS, DELAY
ELEMENTS(EXPLOSIVE)), IGNITION, HEAT OF
COMBUSTION, DIFFERENTIAL THERMAL ANALYSIS, BURNING
RATE, EXPLOSIVE MATERIALS, EXPERIMENTAL DATA
IDENTIFIERS: HEAT OF EXPLOSION

(U)

(U)

HEAT OF EXPLOSION, IGNITION TEMPERATURE, AND
MCLAIN PROPAGATION INDEX, PI, DEFINED AS
HEAT OF EXPLOSION DIVIDED BY IGNITION TEMPERATURE,
ARE CORRELATED FOR VARIOUS PYROTECHNIC DELAY AND
IGNITION COMPOSITIONS. A NOVEL PROPAGATION INDEX,
DESCRIBED BY HEAT OF EXPLOSION, IGNITION TEMPERATURE,
BURNING RATE, AND DENSITY IS PROPOSED AS A
COMPARATIVE SCREENING CRITERION FOR PYROTECHNIC
COMPOSITIONS. (AUTHOR)

(U)

UNCLASSIFIED

CORPORATE AUTHOR - MONITORING AGENCY

*ABERDEEN PROVING GROUND MD MATERIEL
TEST DIRECTORATE

* * *

APG-MT-3307

ENGINEERING TEST OF FLARE,
SURFACE, PARACHUTE, XM183,
(BATTLEFIELD ILLUMINATION SYSTEM).
AD-860 396

*ABERDEEN PROVING GROUND MD

* * *

DPS 199

BALLISTIC COMPARISON OF SHELL,
76-MM, WP-T, T140E4, WITHOUT
TRACER, AND SHELL, 76-MM, HE, M352
AD-255 812

*ADVISORY GROUP FOR AERONAUTICAL
RESEARCH AND DEVELOPMENT PARIS
(FRANCE)

* * *

396

SPECIAL ROCKETS AND
PYROTECHNICS PROBLEMS
AD-287 544

*AERONAUTICAL SYSTEMS DIV WRIGHT-
PATTERSON AFB OHIO

* * *

ASD-TN61 53

PHYSICAL PROPERTIES OF
INSULATORS MOLECULAR CRYSTALS AND
MAGNETIC MATERIALS
AD-268 666

*AEROSPACE MEDICAL RESEARCH LAB WRIGHT-
PATTERSON AFB OHIO

* * *

AMRL-TR-69-121

VISUAL PERFORMANCE WITH
SIMULATED FLARELIGHT IN ARTIFICIAL
CLOUDS.
AD-704 125

* * *

AMRL-TR-69-128

FLARE RANGE ESTIMATION;
EVALUATION OF AIDS.
AD-715 287

* * *

AMRL-TR-70-30

VISUAL PERFORMANCE WITH

SIMULATED FLARE LIGHT: EFFECTS OF
FLARE-IGNITION ALTITUDE,
AD-733 548

*AEROSPACE MEDICAL RESEARCH LABS
WRIGHT-PATTERSON AFB OHIO

* * *

AMRL-TR-68-112

VISUAL SEARCH AND DETECTION
UNDER SIMULATED FLARE LIGHT.
AD-681 129

* * *

AMRL-TR-68-112(II)

VISUAL SEARCH AND DETECTION
UNDER SIMULATED FLARELIGHT: PART
II. EVALUATION OF A 5,000,000
CANDLEPOWER (C-P) SOURCE.
AD-686 424

*AIR FORCE AERO PROPULSION LAB WRIGHT-
PATTERSON AFB OHIO

* * *

AFAPL-TR-68-47

INVESTIGATION OF PYROTECHNIC
GENERATED GAS DISCHARGE FIRE
EXTINGUISHING SYSTEM.
AD-833 991

* * *

AFAPL-TR-69-66

DEVELOPMENT OF FULL SCALE
PYROTECHNIC GENERATED GAS DISCHARGE
FIRE EXTINGUISHING SYSTEM.
AD-860 068

*AIR FORCE ARMAMENT LAB EGLIN AFB FLA

* * *

AFATL-TR-71-123

MEASUREMENT OF LINEAR BURN
RATES OF HEAT PRODUCING SYSTEMS.
AD-733 592

*AIR PROVING GROUND CENTER EGLIN AFB
FLA

* * *

APGC-TDR-63-27

ENGINEERING INVESTIGATION OF
IGNITION FAILURE RATE OF TAU-15/B
INFRARED TARGET FLARES,
AD-404 853

*AMCEL PROPULSION CO ASHEVILLE N C

0-1

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ARM-ARM

* * *

ATR-50
INVESTIGATION OF HAZARDS IN THE
PROCESSING OF PYROTECHNIC MIXTURES
FOR CHEMICAL AGENT MUNITIONS.
AD-474 401

*ARMY CHEMICAL WARFARE LABS ARMY
CHEMICAL CENTER MD

* * *

CWL-TM-26-12
THE TOXICITY OF COMBUSTION
PRODUCTS OF PYROTECHNICS.
AD-474 403

*ARMY INFANTRY BOARD FORT BENNING GA

* * *

USAIB-3095
SERVICE TEST OF FLARE, SURFACE,
PARACHUTE, XM183 (BATTLEFIELD
ILLUMINATION SYSTEM).
AD-860 514

*ARMY LAND WARFARE LAB ABERDEEN
PROVING GROUND MD

* * *

LWL-CR-21F69
REMOTELY INITIATED ILLUMINATING
PERIMETER ROCKET (RIPER).
AD-733 919

*ARMY MATERIEL COMMAND WASHINGTON D C

* * *

AMC-PAM-706-186
ENGINEERING DESIGN HANDBOOK.
MILITARY PYROTECHNICS SERIES. PART
TWO-SAFETY, PROCEDURES AND
GLOSSARY.
AD-830 371

*ARMY TEST AND EVALUATION COMMAND
ABERDEEN PROVING GROUND MD

* * *

MTP-4-2-131
PYROTECHNIC SIGNALS.
AD-718 784

* * *

MTP-4-2-132
TACTICAL LUMINANTS.
AD-729 845

* * *

MTP-4-3-108

PROJECTILE AND CARTRIDGES,
SMOKE.
AD-718 673

* * *

MTP-4-3-116
PROJECTILE, ILLUMINATING.
AD-718 702

* * *

MTP-4-3-148
FLARE, AIRCRAFT.
AD-868 258

* * *

MTP-8-2-091
GRENADES, HAND OR WEAPON
LAUNCHED, SMOKE/INCENDIARY.
AD-718 764

* * *

MTP-8-2-092
GRENADES, HAND OR WEAPON
LAUNCHED, SMOKE, COLORED, MARKING.
AD-871 762

* * *

MTP-8-2-190
TARGET AND AREA SMOKE MARKING
MUNITION SUBSYSTEM FOR ARMY
AIRCRAFT.
AD-718 752

* * *

MTP-8-3-190
TARGET AND AREA SMOKE MARKING
MUNITION SUBSYSTEM FOR ARMY
AIRCRAFT.
AD-871 791

* * *

MTP-8-4-011
ARCTIC ENVIRONMENTAL TEST OF
SMOKE MUNITIONS AND GENERATING
EQUIPMENT.
AD-872 078

*ARMY TROPIC TEST CENTER FORT CLAYTON
CANAL ZONE.

* * *

USATTC-7005004
INTEGRATED ENGINEERING AND
SERVICE (TROPIC ENVIRONMENTAL) TEST
OF FLARE, SURFACE, PARACHUTE XM183
(BATTLEFIELD ILLUMINATION SYSTEM).
AD-874 207

O-2

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ATL-DEN

*ATLANTIC RESEARCH CORP ALEXANDRIA VA

SURVEY OF RECENT INVESTIGATIONS
OF PLASTICBONDED AND CASTABLE SMOKE
COMPOSITIONS.
AD-422 745

*BUREAU OF NAVAL WEAPONS WASHINGTON D
C

NAVWEPS-8250
FLARE PERFORMANCE INVESTIGATION
AD-299 293

NAVWEPS-OP3237
SAFETY PRINCIPLES FOR
LABORATORY AND PILOT-PLANT
OPERATIONS WITH EXPLOSIVES,
PYROTECHNICS, AND PROPELLANTS.
AD-446 737

*BUREAU OF NAVAL WEAPONS
HYDROBALLISTICS ADVISORY COMMITTEE
WASHINGTON DC

NAVWEPS-OP2793
TOXIC HAZARDS ASSOCIATED WITH
PYROTECHNIC ITEMS.
AD-436 880

*CHEMICAL RESEARCH AND DEVELOPMENT
LABS EDGEWOOD ARSENAL MD

3062
DEVELOPMENT OF A NONHAZARDOUS
TECHNIQUE FOR QUANTITATIVELY
EVALUATING THE INHALATION
EFFECTIVENESS OF CW MUNITIONS
AD-268 982

CRDL-SPECIAL PUB-1-54
BURNING TEMPERATURES AND
PRESSURES OF M18 COLORED-SMOKE
GRENADES.
AD-474 437

CRDL-TM-2-34
HUMAN FACTORS EVALUATION OF THE
E24 CS MUNITION.
AD-474 350

SP1 27
COMPARISON OF DECHLORANE AND
HEXACHLOROETHANE IN SMOKE SCREEN
COMPOSITIONS
AD-266 364

*CORNELL AERONAUTICAL LAB INC BUFFALO
N Y FLIGHT RESEARCH DEPT

FRM-421
STRUCTURAL REPORT: PIPER AZTEC
FLARE MOUNT.
AD-689 092

*DENVER RESEARCH INST COLO

STUDY OF GELLED ILLUMINANT
COMPOSITIONS.
(NAD-CR-RDTR-116)
AD-671 827

480-6604-F
PROCESSES OCCURRING IN
PYROTECHNIC FLAMES.
(IDEP-415.00.00.00-X9-08)
AD-637 512

DRI-880-6703-F
EVALUATION OF PROCESSES
OCCURRING IN PYROTECHNIC FLAMES.
(IDEP-415.00.00.00-X9-11)
AD-655 820

DRI-880-6703-F-APP
BLACK BODY FUNCTIONS FOR
PYROTECHNICISTS,
(NAD-CR-RDTR-90)
AD-652 822

DRI-2460
THE FEASIBILITY OF USING THE
PRESSURE-TIME DATA FROM A SOLID-GAS
REACTION AS A MEASURE OF THE
REACTIVITY OF A PYROTECHNIC
MATERIAL.
(NAD-CR-RDTR-133)
AD-679 160

*DENVER RESEARCH INST COLO MECHANICS
DIV

DEN-EDG

UNCLASSIFIED

PROCEEDINGS OF FIRST
PYROTECHNIC SEMINAR,
(NAD-CR-RDTR-131)
AD-679 911

448-6512-F
A NEW SMOKE SCREENING CHEMICAL
FOR USE IN AERIAL SMOKE TANKS.
AD-479 680

DRI-2304
A NEW SMOKE SCREENING CHEMICAL
FOR USE IN AERIAL SMOKE TANKS.
AD-479 680

DRI-3976-6803-F
STUDY OF SPECTRA OF METAL-
OXIDANT COMBINATIONS.
(IDEP-415.00.00.00-X9-12)
AD-673 976

DRI-4050-6807-F
RADIATION INTENSITY PRODUCED BY
EXPLOSIVELY EXCITED ARGON GAS.
(NAD-CR-RDTR-132)
AD-676 510

DRI-4178-7003-F
STUDY OF ILLUMINATING FLAMES
FROM SOLID REACTANTS.
(IDEP-415.50.55.20-X9-01)
AD-707 720

DRI-4339-7105-F
FLARE FLAME PHENOMENA.
(NAD-CR-RDTR-186)
AD-729 104

*DENVER RESEARCH INST COLO MECHANICAL
SCIENCES AND ENVIRONMENTAL
ENGINEERING DIV

DRI-4260-7102-F
CALCULATION OF SELF-SUSPENDED
FLARE TRAJECTORIES.
(NAD-CR-RDTR-193)
AD-731 683

*DEVELOPMENT AND PROOF SERVICES
ABERDEEN PROVING GROUND MD

DPS-1866
ENGINEERING TEST (SAFETY
RELEASE) OF AERIAL SMOKE MARKER AND
SMOKE MARKER DISPENSER, SMD-1.
AD-477 103

DPS-2209
ENGINEERING TEST OF GRENADE
DISPENSING ADAPTER, LVL 8DA-3
(SAFETY RELEASE).
AD-805 969

DPS-2324
ENGINEER DESIGN TEST OF
CARTRIDGE, 40-MM, SMOKE, POSITION
MARKER (SAFETY RELEASE).
AD-811 218

*DOW CHEMICAL CO MIDLAND MICH
SCIENTIFIC PROJECTS LAB

POLYMER-BASED PYROTECHNIC
FORMULATIONS FOR THE DISSEMINATION
OF COLORED SMOKES.
AD-481 387

*DUGWAY PROVING GROUND UTAH

DPG-R-387
SURVEILLANCE TEST
(ENVIRONMENTAL) OF GRENADE, HAND
RIOT, CS, ABC-M7A2; DPGR 387.
AD-427 565

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EXPERIMENTAL HIGH INTENSITY
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*OGDEN AIR MATERIEL AREA HILL AFB UTAH

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